Ontario Shorebird
CONSERVATION PLAN

K. ROSS
K. ABRAHAM
R. CLAY
B. COLLINS
J. IRON
R. JAMES
D. MCLACHLIN
R. WEEBER

Environment Canada
Environnement Canada

Hudsonian Godwit / ***Mark Peck***

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Environment Canada
Canadian Wildlife Service
4905 Dufferin Street
Downsview, ON M3H 5T4

Tel: (416) 739-5830; Fax: (416) 739-5845
E-mail: Wildlife.Ontario@ec.gc.ca

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executive summary

The province of Ontario provides vitally important staging and breeding habitat for Western Hemisphere shorebirds. Of 29 shorebird species commonly occurring in Ontario, major staging concentrations of 14 species amass in the hundreds of thousands. Of 40 species of shorebirds that breed routinely in Canada, 22 regularly breed in Ontario, including significant proportions of the populations of seven species.

However, of shorebirds regularly occurring in the province, populations of at least 21 species are either suspected or confirmed to be in long-term decline. There is a need for Ontario to join with the rest of Canada, the United States, Mexico and other nations of the Western Hemisphere to form a comprehensive shorebird conservation plan to address hemispheric declines in many shorebird species.

A similar conservation initiative has been applied to waterfowl for over a decade under the North American Waterfowl Management Plan (NAWMP). Because of the success of this plan to both birds and landowners, the same approach is being extended to other groups of birds. Other initiatives, such as Partners in Flight (PIF), Important Bird Areas (IBAs), Wings Over Water (WOW – the Canadian component of the North American Waterbird Conservation Plan), Canadian Landbird Monitoring Strategy, and Canadian and United States Shorebird Conservation Plans, broaden bird conservation to include many additional species. The North American Bird Conservation Initiative (NABCI) is attempting to provide coordination among nations and peoples of this continent to improve effectiveness of these various conservation initiatives. The Ontario Shorebird Conservation Plan (OSCP) provides a working complement in the Ontario region to the broader Canadian Shorebird Conservation Plan to help sustain healthy shorebird populations in North America.

The OSCP has been prepared by a committee representing a range of government and non-government organizations, and is derived from existing information and expert opinion in order to define the state of the shorebird resource in Ontario, identify critical information gaps and science needs, and to identify conservation measures that can be acted on immediately. It is intended that this plan be updated routinely as needed information comes available and further conservation actions are determined.

The overall goals of the OSCP are to:

1) sustain, and restore when necessary, the distribution, diversity, and abundance of breeding and migrating shorebirds in Ontario;
2) ensure sufficient high-quality habitat to support healthy shorebird populations in Ontario;
3) ensure coordinated efforts are instituted to address vital conservation issues for shorebirds in Ontario, based on information on conservation needs and practices made widely available to decision makers, land managers, and the public.

The specific objectives of the OSCP are to:

1) determine population sizes and trends for each species breeding in or migrating through Ontario;
2) identify and evaluate habitat needs and significant sites for breeding and migrating shorebirds in Ontario;
3) establish conservation priorities for shorebirds in Ontario, reflecting their ranking in the Canadian Plan, their biological vulnerability, and the responsibility Ontarians share for these species;
4) identify Ontario-based causes of population decline and identify the conservation actions needed to reduce or eliminate present and potential threats to shorebirds and their habitats in Ontario; encourage and, where possible, assist in mitigating causes of declines in other parts of the hemisphere for those species which are important to Ontario.

To achieve the above goals and objectives, the following science needs are considered priorities:

- Accurately determine breeding distributions and develop abundance estimates for northern breeding species, and update knowledge of distribution and abundance for southern breeding species.
- Monitor population trends of some northern breeding species where possible, and of southern breeding species, through enhanced use of existing surveys; for any species determined to be in serious decline, identify the population parameters having greatest effect on trend and the stressors impacting them in order to develop and assess management programs.
- Accurately monitor total numbers of migrant shorebirds passing through the province by studying the distribution of birds and turnover rates in both northern staging concentrations and more dispersed southern movements.
- In cooperation with other jurisdictions, establish breeding origins, migratory pathways, and wintering areas for breeding and migrating shorebirds using Ontario habitats.
- Determine specific habitat requirements of breeding and migrant shorebirds to identify critical habitat.
- Examine and determine the severity of potential threats to shorebird populations.

These actions will contribute to the refining of the following conservation and management strategies, aspects of most of which can in fact be pursued immediately:

- Contribute to the development of land use policies, habitat management plans, recovery plans, and site designations of various types (e.g., Western Hemisphere Shorebird Reserve Network and Important Bird Areas).
- Determine appropriate conservation actions in response to active threats to shorebird populations.
- Monitor hunting pressure, and ensure that harvest is at a level sustainable for the target populations.
- Develop educational initiatives to inform the public and interest groups about shorebird biology, habitat, and conservation requirements to increase understanding of the value of shorebirds generally and of their importance in Ontario.
- Develop landowner and/or manager agreements and experimental management activities to secure, protect, enhance, and restore shorebird habitats.

The OSCP also provides information on the species occurring in the province, their general distribution, status, and habitat associations; outlines research programs that, in part at least, have included shorebirds; discusses efforts toward avian conservation in the province that directly or indirectly benefit shorebirds; describes potential threats to populations; and indicates significant areas for shorebirds in the province. The communications section sets out the direction and key messages to be put forth from the plan, and the implementation section illustrates how a variety of partnerships and programs can be integrated to further develop and implement this plan.

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1.1 Goals and Objectives

The **vision** of the Canadian Shorebird Conservation Plan (CSCP: Donaldson et al. 2001) is to maintain healthy populations of shorebirds throughout their range and diversity of habitats in Canada and throughout their global range.

Its **mission** is to build the scientific basis for shorebird conservation, identify and protect crucial habitat, restore species that are declining, and establish links with other countries that share Canada's shorebirds.

The Ontario Shorebird Conservation Plan (OSCP) is to serve as a working complement in Ontario to the broader national plan by providing a provincial context and detailing specific conservation initiatives.

The *goals* of the OSCP are as follows:

- **Populations** – to sustain, and restore when necessary, the distribution, diversity, and abundance of breeding and migrating shorebirds in Ontario;
- **Habitats** – to ensure sufficient high-quality habitat to support healthy shorebird populations in Ontario;
- **Conservation** – to ensure coordinated efforts are instituted to address vital conservation issues for shorebirds in Ontario, based on information on conservation needs and practices made widely available to decision makers, land managers, and the public.

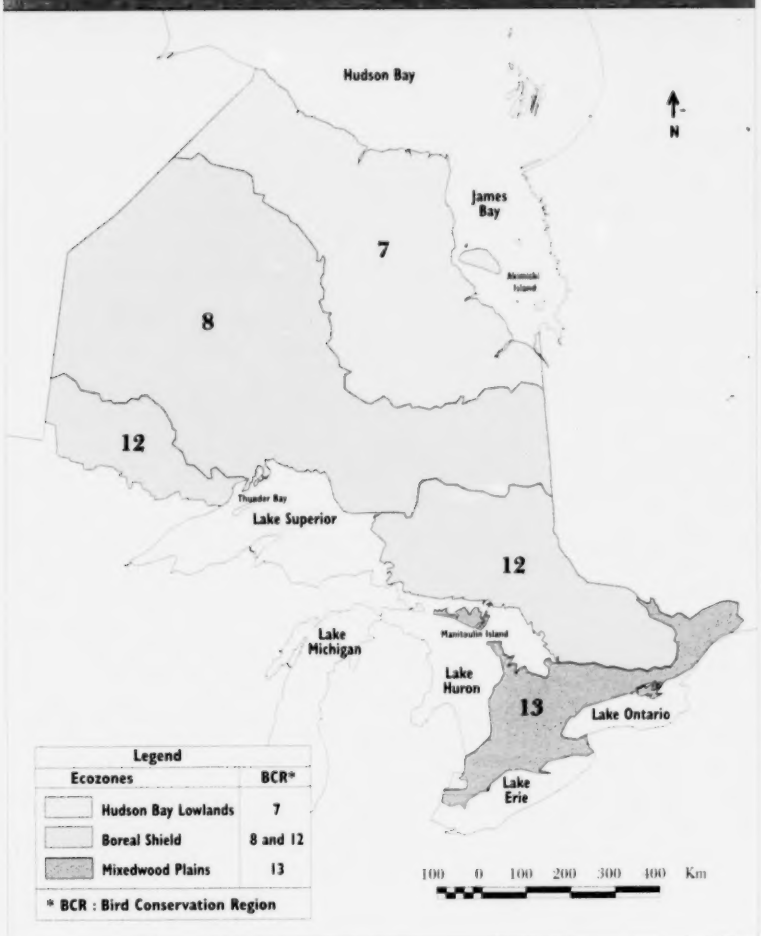
Specific *objectives* of the OSCP are to:

- Determine population sizes and trends for each species breeding in and migrating through Ontario;
- Identify and evaluate habitat needs and significant sites for breeding and migrating shorebirds in Ontario;
- Identify Ontario-based causes of declines in shorebird populations;
- Set conservation priorities for shorebirds in Ontario, reflecting the ranking in the Canadian Plan, their biological vulnerability, and the responsibility Ontarians share for these species;
- Identify specific actions that can be taken to reduce or eliminate present and potential threats to shorebirds and their habitats in Ontario; and,
- Identify and, where possible, assist in reducing or eliminating causes of declines in other parts of the hemisphere of those species which are important to Ontario.

1.2 Ontario in the National Perspective

Ontario environments play a significant role in the annual cycle of shorebirds in Canada, with respect to both migrating and breeding components of their populations. The importance to shorebirds stems, in part, from James Bay and Hudson Bay, which extend far south into the province (Figure 1), and provide a major migration route for arctic-nesting species. The Hudson Bay and James Bay coasts of Ontario host internationally and likely hemispherically significant numbers of migratory shorebirds (Morrison et al. 1995). While single counts of migratory shorebirds in northern Ontario have so far not equalled those in the Bay of Fundy on the east coast, the Fraser Delta on the west coast, or the aggregate of prairie migrants at many locations, the full extent of the shorebird passage through northern Ontario has yet to be determined. Likewise, the magnitude of breeding shorebird populations in the vast mosaic of wetlands covering nearly a third of the province in the Hudson Bay Lowlands is unresolved. This is potentially one of the most significant breeding areas for boreal nesting shorebirds in Canada.

Figure 1: Ecological Divisions of Ontario



The northern coasts of Ontario serve as major staging areas for southbound migratory shorebirds from arctic and boreal areas of Canada. It is likely that several million shorebirds touch down at one or more places along the north coast to replenish fat reserves essential for long flights to staging areas on the Atlantic coast or to wintering areas in South America. Major concentrations of 14 species, along with considerable numbers of nine other species are found here over a period of two months or more each summer and autumn. The Hudson Bay and James Bay coasts are known to be of hemispheric significance to staging flocks of Red Knot and Hudsonian Godwit (Morrison et al. 1995), and probably to other species. Many of these species may also touch down here on northward spring migrations. The extent of spring use is less well understood, but should not be underestimated.

Northern Ontario (Figure 2A), particularly the expansive wetlands of the Hudson Bay Lowlands (Figure 1), hosts large breeding populations of 10 shorebird species and smaller numbers of 12 others. Particularly significant here are populations of breeding Marbled and Hudsonian godwits. An isolated Marbled Godwit population found almost entirely within Ontario, and on Akimiski Island (Nunavut), is small and of uncertain status. The Hudsonian Godwits in the Hudson Bay Lowlands may represent as much as 50 percent of the entire

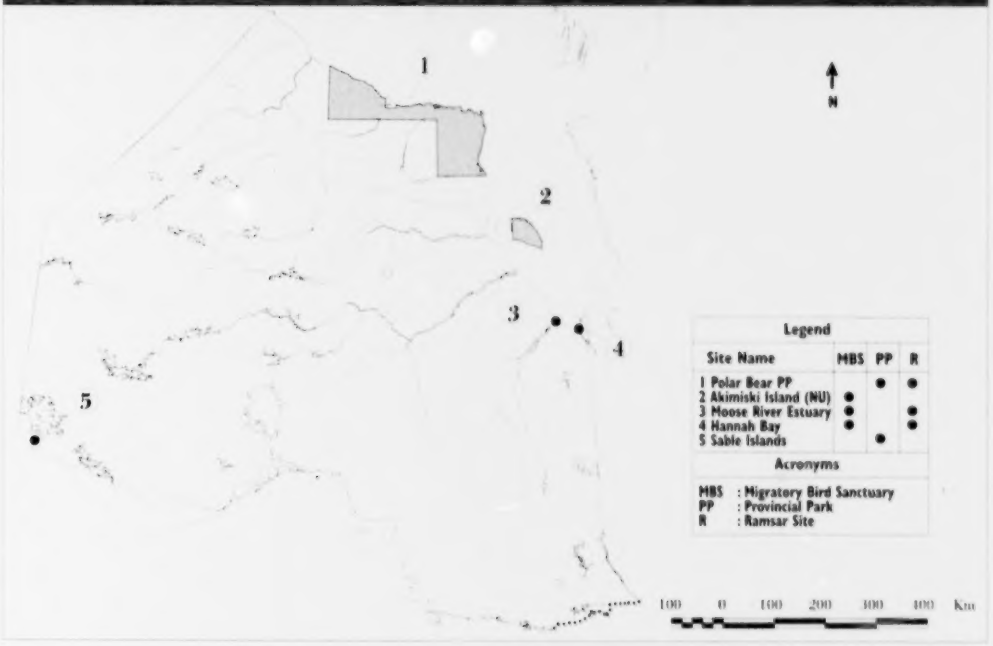
Canadian population, much of that in Ontario. The Hudson Bay Lowlands may also provide the most extensive suitable habitat in Canada for boreal nesting shorebirds such as Greater Yellowlegs, Lesser Yellowlegs, and Common Snipe.

Southern Ontario (Figure 2B) regularly hosts 25 species of migratory shorebirds in substantial numbers, with smaller numbers of 10 others. Although large concentrations are restricted to a few locations such as Presqu'ile and the onion fields in the south-west, most migrant shorebirds are found widely dispersed in smaller numbers among the many small wetlands, river and lake shores, and sewage lagoons inland, as well as countless places along the entire length of the Great Lakes coasts. Shorebirds are very opportunistic in their use of every wetland, capable of exploiting the smallest areas, as well as those varying in water levels from year to year. It is likely that tens of thousands regularly use southern habitats during both migration periods.

Southern Ontario also hosts six species of breeding shorebirds, including populations of American Woodcock and Upland Sandpiper, that are of conservation concern. The Great Lakes shores were formerly a breeding area for a population of Piping Plovers now considered endangered in the province. A few may still nest occasionally in the northwest at Lake of the Woods but none were noted there during the 2001 census (C. Gratto-Trevor, pers. comm.).

The northern coasts of Ontario have been identified as exceptionally important not only to shorebirds, but also to waterfowl and other species. North coast habitat preservation must be a focus of conservation efforts. The concentrations of shorebirds occurring there also provide unique opportunities for study and monitoring. In southern Ontario, conservation of known important sites is also a priority; however, there is also a need to assess the importance of more widely dispersed habitats to breeding and migrating shorebirds. A summary of the 29 species of shorebirds that regularly occur in Ontario, with population trends, conservation priorities, and migratory and breeding status, are given in Tables 1 and 2. Together these

Figure 2A: Protected Areas Important to Shorebirds in Northern Ontario

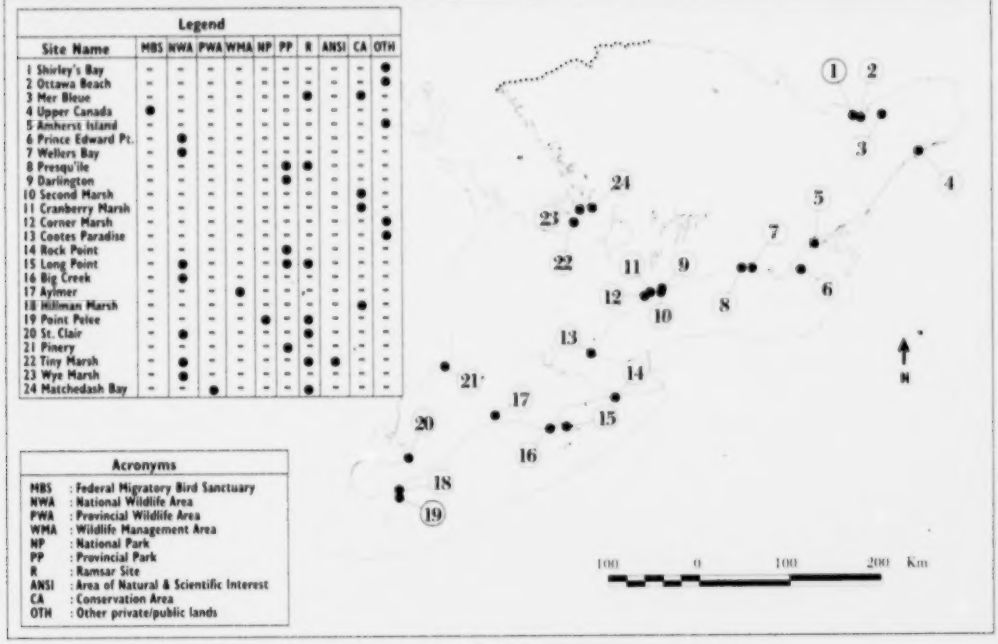

1
2
3
4
5
N
Legend
Site Name | MBS | PP | R
1 Polar Bear PP | | ● | ●
2 Akimiski Island (NU) | ● | |
3 Moose River Estuary | ● | | ●
4 Hannah Bay | ● | | ●
5 Sable Islands | | ● |
Acronyms
MBS : Migratory Bird Sanctuary
PP : Provincial Park
R : Ramsar Site
100 0 100 200 300 400 Km

summaries indicate most importantly that population declines are suspected or confirmed for at least 21 of these species.

The significance of Ontario to shorebirds is emphasized throughout this plan. However, conservation efforts for shorebirds will often overlap with those for other bird species, with mutual benefits. The OSCP forms part of the CSCP, with the latter plan providing the framework for conservation at a national and international level and the Ontario plan providing prioritized goals for implementation of conservation efforts. Shorebird conservation in Canada is linked to the United States Shorebird Conservation Plan (Brown et al. 2000) through cooperative programs. As other shorebird conservation efforts develop elsewhere in the hemisphere, such as the Mexican Shorebird Conservation Initiative, similar linkages are expected. The integration of conservation for all birds at a landscape level is now being undertaken through the North American Bird Conservation Initiative (NABCI). To facilitate this integration, the continent has been divided into ecological units called Bird Conservation Regions (BCRs) that provide a geographical basis for planning. Ontario contains parts of four BCRs (Nos. 7, 8, 12, and 13 – see Figure 1) of which two (7 in the north and 13 in the south) are the most important for shorebird conservation. BCRs are referenced throughout this document to support the planning process.

In Canada, NABCI will provide the framework that integrates and coordinates four bird conservation initiatives: the CSCP for shorebirds, the North American Waterfowl Management Plan (NAWMP), Partners in Flight (PIF) for landbirds, and Wings Over Water (WOW) for other waterbirds. Some of Ontario's wetlands critical for shorebirds are also internationally recognized, or candidates for recognition, under complementary programs of the Western Hemisphere Shorebird Reserve Network (WHSRN), the Ramsar Convention, and Important Bird Areas (IBAs) program. Lastly, Ontario's plan is directly linked with the *Species at Risk Act* and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Figure 2B: Protected Areas Important to Shorebirds in Southern Ontario



1.3 Shorebird Conservation in Ontario

1.3.1 HISTORY

Subsistence hunting for shorebirds has probably contributed at least in a minor way to the food of aboriginal peoples (Sadler 1994) without affecting populations. Hunting for both the market and personal food, including the taking of large numbers of shorebirds, was a commonly practiced activity in southern Ontario in the late nineteenth and early twentieth centuries (Foster 1978, Smith 1998). Such activities in many parts of North America caused declines of some shorebird species. This was also a period when egg collecting was a wildly popular activity (Peck and Richards 1994). With the passage of the Migratory Birds Convention Act ***of 1917, all shorebirds were afforded protection. Hunting seasons in autumn were retained only for American Woodcock and Common Snipe, and remain in effect today. The passage of the Ontario*** Endangered Species Act ***in 1971 (McKeating and Bowman 1977) was aimed at affording protection to species like the Piping Plover.***

Most naturalist groups were founded to promote nature study, but also to encourage the need for conservation of wildlife (McNicholl and Cranmer-Byng 1994). With growing public awareness, the conservation value of wetlands and shorelines has also been increasingly recognized. Habitat securement, restoration, enhancement, and creation have come to be of primary importance in the maintenance of wildlife populations, and have become a focus of many conservation efforts. Yet, even in recent years, wetlands of importance to shorebirds and other wildlife continue to be degraded, drained, and filled.

1.3.2 SHOREBIRD RESEARCH AND MONITORING IN ONTARIO

Little specific shorebird research and monitoring had taken place in Ontario prior to the early 1970s (James in prep.). Although various banding projects date back to 1905 in Ontario (McNicholl 1994), the first monitoring and banding of a long-term nature followed the establishment of Long Point Bird Observatory in 1960. Several shorebird-specific studies appeared under the Long Point banner (e.g., Bradstreet et al. 1977, Nol and Lambert 1984, Page 1967, Page and Bradstreet 1968, Page and Middleton 1972). While monitoring and banding of shorebirds have not been a major focus of Long Point Bird Observatory or other bird observatories now operating in Ontario, these stations can still provide useful monitoring information on species like Killdeer, American Woodcock and Common Snipe.

Shorebird studies in northern Ontario began with Canadian Wildlife Service projects in 1963 and 1965, when Leslie Tuck banded about 1,500 Common Snipe in southern James Bay (Tuck 1967). Additional banding took place near Winisk (Tuck 1968). In 1974, a comprehensive shorebird banding and marking project was initiated in James Bay by Guy Morrison (Morrison 1976, 1978), which continued into the early 1980s. This study became part of an international effort to document distribution, migration, and population sizes of shorebirds in the Western Hemisphere. Aerial surveys of sections of the coastlines have been undertaken since the mid 1970s, and five surveys (May to October) in 1990 identified peak migration periods and concentration points. A number of late August surveys added more distributional information, and indicated potential bias from wind and tidal influences. This work has clearly indicated the importance of the northern coastal areas to staging migrant shorebirds and identified several areas that should be part of the WHSRN (Morrison et al. 1995).

The North American Breeding Bird Survey, coordinated by the Canadian Wildlife Service, has been operating in Ontario since 1968 (Downes and Collins 1996). In 2001, there were 122 active routes, concentrated in southern and central Ontario. It provides information on six shorebird species, but probably yields sufficient information to be useful in monitoring populations only for Upland Sandpiper and part of the ranges of Killdeer and Spotted Sandpiper.

The Ontario Ministry of Natural Resources has coordinated singing ground counts of American Woodcock, and to a lesser extent Common Snipe, in Ontario for about 35 years. There are about 50 routes active, mostly in southern and central Ontario. Migratory game bird harvest statistics have also been compiled for both species for a similar period by the Canadian Wildlife Service.

The Ontario Nest Records Scheme began compiling nesting records of birds in 1956. Published literature and private field notes have been searched for additional records prior to that time. There are more than 3,100 shorebird records on file now, mainly for Killdeer, Spotted Sandpiper, and American Woodcock. Historical Piping Plover records are also a significant holding (Peck 2000).

The Ontario Shorebird Survey was initiated in Ontario by the Canadian Wildlife Service in 1974 as part of an international shorebird survey effort in North America, attempting to gather population estimates, and identify trends in numbers. It is helping to identify important areas for migrant shorebirds in southern Ontario (R.K. Ross, pers. comm.). Volunteers following standard protocols gather counts and estimates of both spring and autumn migrant shorebirds. Nearly 100 sites have received some coverage, mainly near the lower Great Lakes. Participation and continuity have not been as high as desired, but enough information has been gathered to suggest declining trends for 14 species, one of which was statistically significant (Ross et al. 2001). This survey will contribute to the internationally coordinated Program for Regional and International Shorebird Monitoring (PRISM). PRISM was initiated to meet the monitoring needs of the Canadian and United States shorebird plans, with the vision that reliable and timely information on the status and trends of all shorebird populations that breed in North America will contribute to their long-term conservation. The program is divided into four main strategies designed to give accurate indications of shorebird distribution, trends, and abundance, including surveys of temperate non-breeding shorebirds on migration such as the Ontario Shorebird Survey, surveys of breeding birds in arctic and boreal regions, surveys of temperate breeding shorebirds, and surveys at southern latitudes of non-breeding birds.

Annual breeding waterfowl surveys of central and north-eastern Ontario carried out since 1990 as part of the Black Duck Joint Venture of NAWMP have provided useful distribution and trend information for Spotted and Solitary sandpipers.

Numerous volunteers and naturalist club members gather local bird sightings that are contributed to American Birds/Field Notes, provincial and national park records, the Natural Heritage Information Centre (Ontario Ministry of Natural Resources), breeding bird atlas programs, and rare breeding bird programs; the recently established ONTBIRD Web site has become a very important resource for sighting information. Much of our knowledge of shorebird distribution and abundance comes from the efforts of volunteers.

ONTBIRD ON-LINE: www.ofo.ca/ontbirdsguide.htm

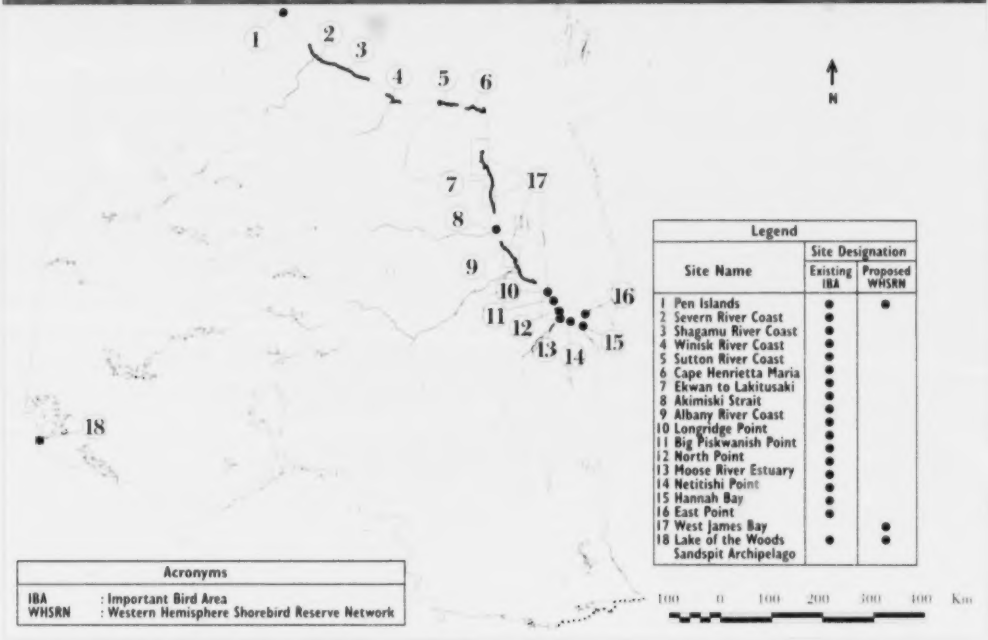
Common Snipe / Ross James

1.3.3 CONSERVATION OF SHOREBIRD HABITAT IN ONTARIO

Several programs are active in Ontario that will help to identify, protect and enhance habitats that are of importance to shorebirds. The Ramsar Convention on Wetlands was drafted in 1971 to draw international attention to serious threats to wetlands recognized to be of international importance. Canada became a signatory in 1981, pledging to maintain the ecological, zoological, botanical, limnological, and hydrological significance of designated wetlands. In Ontario, eight sites have been designated (Ramsar Convention Bureau 1998), protecting 2,449,528 hectares of wetlands, including Point Pelee National Park, St. Clair National Wildlife Area, Long Point, the Southern James Bay Migratory Bird Sanctuaries, Polar Bear Provincial Park, Matchedash Bay Provincial Wildlife Area, and Mer Bleue Conservation Area (Figure 2). These sites provide valuable resources for migrant shorebirds and in the case of Polar Bear Provincial Park, to breeding shorebirds.

A major program, directed specifically at shorebirds, is the WHSRN, which is an international initiative to promote shorebird conservation throughout their ranges in the Western Hemisphere. WHSRN is both a network of people and a network of key shorebird habitats. Individuals and organizations are encouraged to work in partnership with others locally and within the network. Through this program, critical habitats/sites are designated as hemispherically, internationally, or regionally important, or essential for endangered species (Morrison et al. 1995), depending upon overall numbers and proportions of populations using the sites. While no site has been officially designated in Ontario, the west coast of James Bay is considered to be potentially of hemispheric importance, and four stretches of

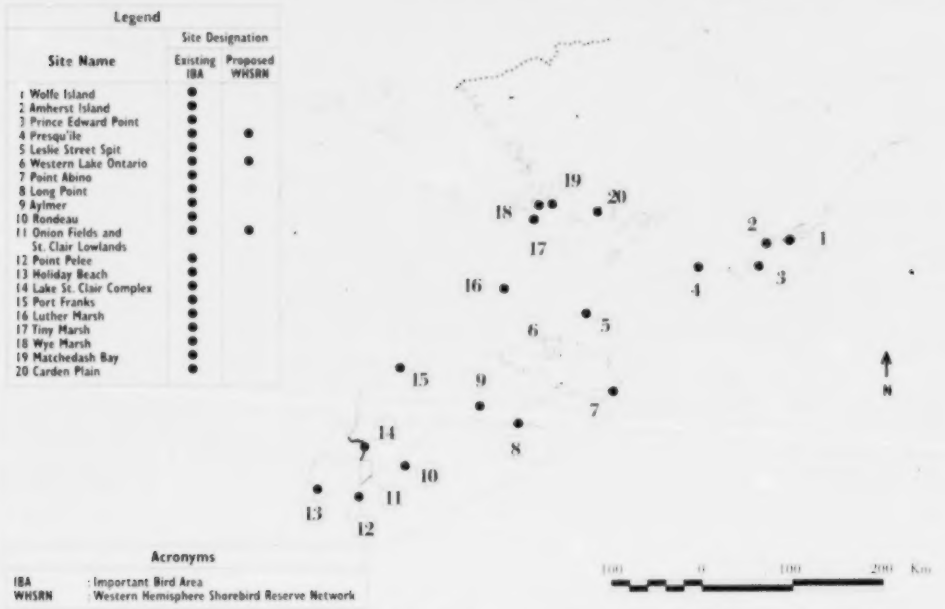
Figure 3A: Existing and Proposed Areas for Special Designation in Northern Ontario



the coastline are identified as concentration areas (Figure 3A). Also identified is a potentially internationally important site on the Hudson Bay coast around the Pen Islands. On Lake of the Woods, Sable Islands, now designated as a provincial nature reserve in the provincial parks system, have been identified as potential Endangered Species sites. Piping Plover may still breed in these areas, the last known nesting sites in the province. Three regionally important sites in southern Ontario at Presqu'ile Provincial Park, the western end of Lake Ontario, and the onion fields and St. Clair Lowlands of south-western Ontario are also being considered.

network of sites to ensure the long-term viability of naturally occurring bird populations. Sites are designated in four categories as providing habitat for threatened species, restricted-range species, biome-restricted or biome-representative species, and congregatory species. More than 130 sites have been nominated as IBAs throughout Ontario. Collectively, these sites provide breeding habitat for a few shorebird species and migratory foraging areas for many species. Most of the northern coastal areas, of vital importance to hundreds of thousands of migrant shorebirds, have been

Figure 3B: Existing and Proposed Areas for Special Designation in Southern Ontario



The IBA program is a site-based initiative that builds on existing bird conservation efforts. It is a conservation program of Birdlife International (formerly International Council for Bird Preservation – ICBP) and is implemented in Canada by the Canadian Nature Federation and Bird Studies Canada. Its aim is to identify and encourage the protection of a worldwide

nominated. More than 30 areas, used to some extent by shorebirds, had been designated by early 2000 (Figure 3).

The NAWMP was initiated in 1986 by the governments of Canada and the United States in response to declining waterfowl numbers and wetland habitat losses across the

continent. Mexico became signatory to the Plan in 1994, making it a truly continental conservation effort. Established in 1989, the Eastern Habitat Joint Venture (EHJV) covers eastern Canada and is one of 17 NAWMP joint ventures instituted across the continent – including the Ontario EHJV. Ontario's EHJV partners[1] have an interest in conserving priority wetland and upland habitats, and promoting ecologically sound and sustainable land use practices. Over the past decade, the partners have secured over 203,796 hectares of wetland and upland habitat, with enhancements to over 115,380 additional hectares.

Since many habitats used by waterfowl are important to other species, including shorebirds, the EHJV partnership is taking steps to better meet shorebird habitat conservation needs in some projects. This expansion is taking place under the NABCI, which aims to bring together partnerships for the conservation and management of habitats required by all bird species. A pilot project has been completed by Ducks Unlimited Canada, in partnership with Bird Studies Canada, to create a 0.8 hectare mudflat habitat for migrating shorebirds near Long Point, in conjunction with restoring a two-hectare wetland in Port Rowan. The mudflat will be managed specifically for shorebirds and the overall, long-term success of this project will be monitored. A second initiative, undertaken between Ducks Unlimited Canada and the Township of West Perth, has been the development of a 10-hectare shorebird management site at the decommissioned Mitchell Sewage Lagoon.

Another core initiative of the EHJV is the Ontario Wetland Habitat Fund, administered by Wildlife Habitat Canada. It is a long-term, landowner-based wetland stewardship program that engages property owners in wetland conservation work. Aside from marsh restoration and enhancement work, the program also encourages wetland re-establishment in regions such as extreme south-western Ontario. In the Essex region, for example, more than 60 landowners have excavated small, shallow wetlands in the heavily drained and deforested landscape. Some are variations on the "wader scrape" used to encourage shorebird use in the United Kingdom, modified here to encourage waterfowl pairing and breeding.

The Great Lakes Wetlands Conservation Action Plan (1994) was developed by the Canadian Wildlife Service and the Ontario Ministry of Natural Resources, with support from the Nature Conservancy of Canada, the Federation of Ontario Naturalists, and numerous non-government organizations as a major habitat initiative under the Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem. Its aims are to rehabilitate and protect 6,000 hectares of wetland habitat every five years. This will benefit marsh nesting shorebirds, particularly Spotted Sandpiper and Common Snipe, and provide habitat of importance to many species of shorebirds that migrate on a broad front through the Great Lakes region.

Many of the federal National Parks (186,521 hectares), National Wildlife Areas (4,883 hectares), Migratory Bird Sanctuaries (39,094 hectares), Provincial Parks (4,265,918 hectares), and various provincial conservation reserves (1,537,194 hectares) protect important shorebird habitats in Ontario. See Figure 2 for those protected areas known to be significant for shorebirds.

Other agencies, groups, policies and programs that can provide either direct or indirect institutional support to shorebird conservation are listed in Appendix 2.

1 Ontario Eastern Habitat Joint Venture partners include the Canadian Wildlife Service, Ontario Ministry of Natural Resources, Ducks Unlimited Canada, the Nature Conservancy of Canada, Wildlife Habitat Canada and the Ontario Ministry of Agriculture and Food.

breeding shorebirds in ontario

2.1 Introduction

Ontario has a wide range of habitats available to breeding shorebirds. Twenty-two species are regularly found nesting here (Table 3; James 1991) and one other (American Avocet) has been known to nest occasionally. Northern Ontario is a more important breeding area than southern Ontario for most of these species. Huge areas of fens and bogs are scattered through the boreal forests, and blanket the Hudson Bay Lowlands covering nearly a third of the province, providing extensive habitat for boreal nesters. The coastal and tundra strip near the James Bay and Hudson Bay coasts attracts a variety of arctic and subarctic nesters. The extensive coastal marshes provide important habitat for several others. Species typical of more prairie-like conditions may extend as far eastward as the western Rainy River District and southern Ontario. The many lakes and rivers, which cover over a sixth of the province, provide shorelines and associated wetlands for other shorebird species.

2.2 Occurrence, Status, and Habitats of Breeding Shorebirds in Ontario

A summary of Ontario's breeding shorebird species, their status, and habitat choices is found in Table 3; distribution maps for most species (from Cadman et al. 1987) are presented in Appendix 1. Killdeer, Spotted Sandpiper, and Common Snipe are the most common and widespread species, being found almost everywhere in the province. Killdeer is far more common in the south, doing very well in open and disturbed environments, even nesting on rooftops. In forested areas to the north, it becomes increasingly rare and, while it even occurs in the Hudson Bay Lowlands, the wetlands there are typically too vegetated except in tidal marshes to be attractive to this species. Spotted Sandpipers breed along the narrow strips of shoreline around rivers and lakes throughout the province. Common Snipe can be found in a variety of wetlands anywhere, and probably is more numerous in the extensive northern wetlands.

Greater Yellowlegs, Lesser Yellowlegs, and Solitary Sandpiper are common and widespread in the north. The former two are mostly found in the northern third of the province in the wetlands of the Hudson Bay Lowlands, but penetrate somewhat farther south into the boreal forests. The Solitary Sandpiper prefers wooded ponds and wetlands across the north and a few may breed as far south as Manitoulin Island.

Locally common along the northern coasts are Semipalmated Plover, Least Sandpiper, Dunlin, and Red-necked Phalarope. They are

Dunlin / Mark Peck

most abundant in tundra areas near the Hudson Bay coast, and all but Dunlin extend southward in small numbers along the coastal marshes most of the length of James Bay. Eight other species are less numerous in the northern tundra strip. The least common are American Golden-Plover, Semipalmated Sandpiper, and Pectoral Sandpiper, which are found mainly in the extreme north-eastern corner near Cape Henrietta Maria. The numbers of Pectoral Sandpipers seem to fluctuate considerably such that some years there may be very few present.

Whimbrel, Hudsonian Godwit, and Stilt Sandpiper are more evenly spread across the Hudson Bay coastal tundra areas, and a few are found along the northern part of the James Bay coast. Marbled Godwits are found mainly in the southern James Bay coastal marshes (and on Akimiski Island – Nunavut). This population is apparently completely isolated from Canadian prairie populations (Gibson and Kessel 1989, Gratto-Trevor 2000), and its status is of concern. A few Marbled Godwits from the Canadian prairie population have also been found nesting in prairie-like areas in the western Rainy River District. The Short-billed Dowitcher is a bird of greater mystery than any of the others. There are so few reports it is uncertain how many there are or just where they may be. They certainly nest along the Hudson Bay coast, and on Akimiski Island, but may also occur in more interior areas and along the James Bay coast.

Also in northern Ontario is the endangered Piping Plover. It was once much more widespread where extensive sand beaches were available around the shores of the Great Lakes. Today it has all but disappeared from Ontario. Only two breeding sites in the Lake of the Woods near Rainy River have been occasionally used in recent years.

Three other species are more usual in southern Ontario, but their ranges also extend northward. Most common is the American Woodcock, widespread in the south where swampy woods and upland thickets with adjacent clearings for display and nesting provide habitat. They are also found across parts of northern Ontario in smaller numbers. The Upland Sandpiper is uncommon and much more restricted in distribution to southern Ontario where it frequents large, grassy fields. A few

American Golden-Plover / Ken Ross, Canadian Wildlife Service

are also found near Thunder Bay and in western Rainy River district in the north. Wilson's Phalarope is very thinly scattered across southern Ontario, often associated with sewage ponds, and a few are found in southern James Bay coastal marshes, and the Lake of the Woods area. It has been expanding its range in the past few decades within the province.

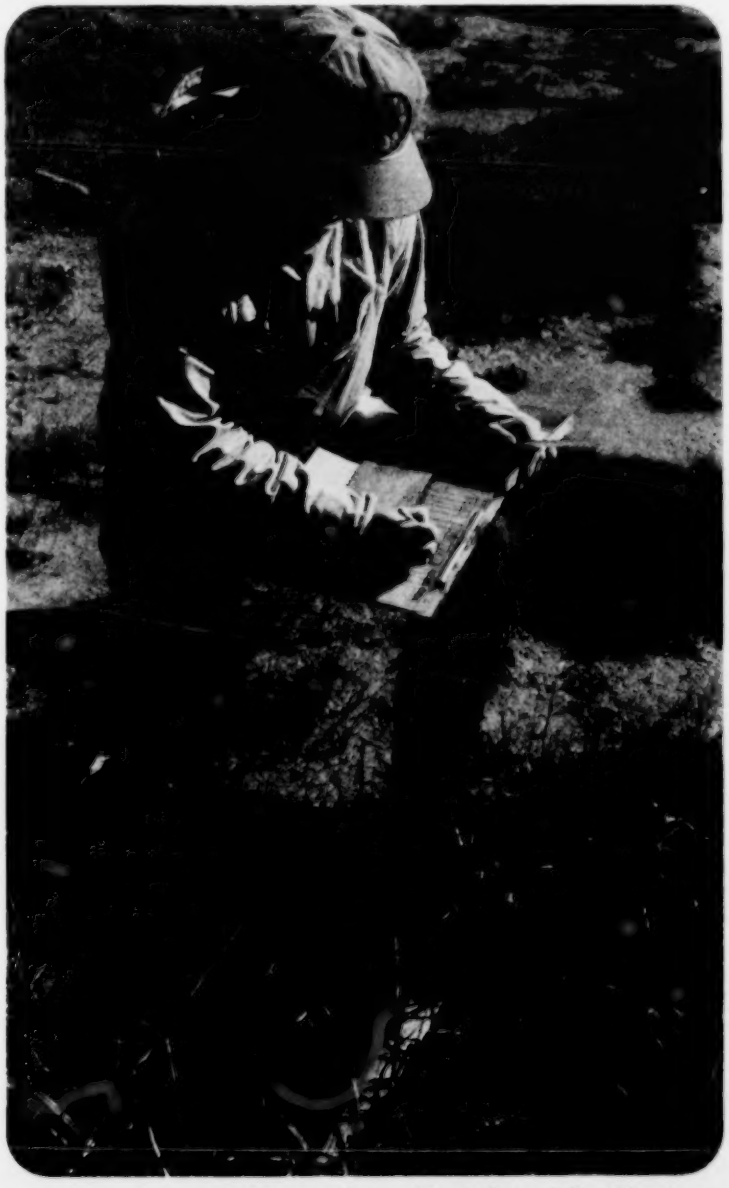
Not included in Table 3 is a single breeding record of American Avocet from Lake of the Woods (Lamey 1981). It is unlikely to be a regular nester in the province, but additional breeding should be watched for as it is being seen more regularly in the province. There has also been a single Purple Sandpiper seen in the Cape Henrietta Maria area in summer in what appeared to be appropriate habitat (Cadman et al. 1987), but there has been no evidence of breeding.

2.3 Significant Areas

The greatest diversity of Ontario's breeding shorebird species is found in the areas along and adjacent to the Hudson and James Bay coasts. Many of the species occurring there have among the most restricted ranges in the province. These northern coastal areas must be seen as essential habitat in the province for nesting shorebirds. Much of these shoreline areas now receive protection in Polar Bear Provincial Park, but large areas still lack any protection other than that provided by inaccessibility.

The few islands in southern Lake of the Woods, part of a sand spit archipelago, are the only remaining habitat known to be recently used by the Piping Plover in Ontario. However, relatively undisturbed extensive sandy shorelines on the southern Great Lakes, such as on Long Point in Lake Erie, south-eastern Lake Huron in the Port Franks/Pinery Provincial Park area, and the south shores of Manitoulin Island, should also be considered essential if we ever expect to have Piping Plovers return to the Great Lakes to breed. Long Point, which is protected under federal and provincial statutes, has been long recognized to have shoreline of outstanding importance, and Pinery Provincial Park protects some more habitats, but other areas need to be clearly identified and afforded protection.

The nesting habitats for other shorebirds are much more dispersed, which makes it difficult to identify areas needing special protection. The alvars and limestone plains of the Great Lakes region, such as the Carden Plain (Pittaway 1999), may be among the most important for Upland Sandpiper, but are only a part of their range. The taiga of the Hudson Bay Lowlands is key for three or four shorebird species, as well as for waterfowl and other species.



Habitat studies at North Point / Guy Morrison, Canadian Wildlife Service

migrating shorebirds in ontario

3.1 Introduction

Many North American species of shorebirds tend to migrate toward the Atlantic coast when moving south in autumn, and to return north through the centre of the continent (James in prep.). As a result, the largest numbers of migrants are seen in Ontario in autumn. These migrants also tend to concentrate in relatively small areas of high food abundance, to fatten up in preparation for long southward flights. On their return in spring, birds are moving rapidly, in a more dispersed fashion, or shift toward the centre of the continent, and considerably fewer of the arctic nesting species are likely to be seen.

In northern Ontario, huge concentrations of 14 species on migration are seen in coastal areas, as well as smaller but often significant numbers of 15 other species. There may be more than 100,000 birds at one time on one section of shoreline. Overall numbers for all species are uncertain, but probably in aggregate several million birds congregate there to take advantage of the food resources over the course of each autumn. At present we can only speculate on the extent of the importance of these shores to most of the abundant migrants that congregate there. The wide intertidal flats provide an abundance of the bivalve *Macoma balthica*, and in southern James Bay, the gastropod *Hydrobia minuta*, as well as a variety of other crustaceans, worms and dipteran larvae (Morrison and Gaston 1986).

In southern Ontario, such vast concentrations are not seen although moderately large numbers are found at several sites. Instead, the birds tend to be widely dispersed among many ponds, marshes or fields, and along the Great Lakes shorelines. They seem very opportunistic and adept at finding and using many widely dispersed and annually variable small sites. They use a variety of mudflats, beaches, and marshes around ponds, lakes, and rivers, as well as sewage ponds, wet fields, and pastures for foraging. Twenty-one species are found in small flocks ranging up to several hundred individuals, along with very low numbers of 14 other species. Mainly, the species that nest in the interior of the province leave on migration without concentrating in any numbers; this makes it difficult to estimate population sizes and trends from migrating numbers.

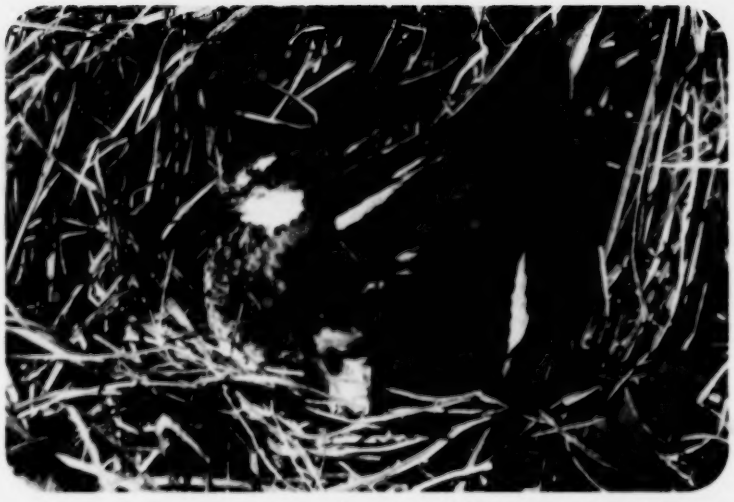
3.2 Occurrence, Status and Habitats of Migrating Shorebirds in Ontario

The 35 species of shorebirds that regularly migrate from or through Ontario are listed in Table 4, which also includes an assessment of their relative abundance in various areas, and the main habitats used. Fourteen of these species (Black-bellied Plover, American Golden-Plover, Semipalmated Plover, Greater Yellowlegs, Lesser Yellowlegs, Whimbrel, Hudsonian Godwit, Red Knot, Sanderling, Semipalmated Sandpiper, Least Sandpiper, White-rumped Sandpiper, Pectoral Sandpiper, and Dunlin) gather in large numbers on the north coast in autumn where the wide tidal mudflats, and intertidal marshes are the main attraction. Thirteen of these species, the exception being the Hudsonian Godwit, are also found widely but lightly dispersed in autumn in the south where they use a variety of mudflats, beaches, and marshes around ponds, lakes, and rivers, as well as sewage ponds, wet fields, and pastures for foraging. In the spring, they may all be found in the north or south in dispersed, smaller numbers. However, they do not gather in the major concentrations on the north coast as found in the autumn, and spring use may also vary with the phenology of melt above the tidal flats.

The northern coasts are particularly important to Hudsonian Godwit, Red Knot, and Dunlin. More than 17,000 Hudsonian Godwits may concentrate at one time, representing more than 20 percent of the estimated total population (Morrison et al. 2001b). Up to 15,000 Red Knots have been counted in a single survey, representing 10 to 20 percent of the entire known wintering population (Morrison et al. 2001b). In total, a far higher percentage of each species' population may use these areas over the course of the autumn migration, taking turnover into account. The large concentrations of Dunlin complete a full prebasic molt along these shores

before continuing their autumn migration (R.I.G. Morrison, pers. comm.).

Although Greater and Lesser Yellowlegs form large flocks on the north coast, these may still represent a relatively small proportion of the population as these species tend to migrate on a broad front. Six other species (Killdeer, Solitary Sandpiper, Spotted Sandpiper, Upland Sandpiper, Common Snipe, and American Woodcock) also seldom congregate although small flocks of some of these species may occasionally be seen. Most frequent a variety of mudflats, shores, and shallow open marshy situations such as wet pastures although Killdeer and Upland Sandpiper prefer uplands and American Woodcock are found almost exclusively in wooded areas.



Red-necked Phalarope / Mark Peck

Five species (Marbled Godwit, Ruddy Turnstone, Stilt Sandpiper, Short-billed Dowitcher, and Red-necked Phalarope) also gather on the north coasts to take advantage of coastal marshes and intertidal mudflats, but their numbers are smaller (flocks rarely larger than the low hundreds) and more dispersed. These five also appear across the rest of the province in small groups or singles. Marbled Godwit and Red-necked Phalarope are rare anywhere except the north coasts.

Ten other species are regular in small numbers, often just individuals, as migrants in Ontario (American Avocet, Willet, Western Sandpiper, Baird's Sandpiper, Purple Sandpiper, Buff-breasted Sandpiper, Ruff, Long-billed Dowitcher, Wilson's Phalarope, and Red Phalarope). While any of the 10 could be found in either the north or south, they are more frequently recorded where there are more observers – in the south. The Ruff is an immigrant from Eurasia, that may now be breeding somewhere in North America, as individuals are occasionally seen on migration in Ontario (Pittaway 1999). Not included in Table 4 is the Piping Plover that no longer appears regularly in Ontario as a migrant, although an occasional one can still be seen. The Eskimo Curlew was also a rare migrant through Ontario but may now be extinct.

3.3 Key Sites used by Migrating Shorebirds

The most essential habitats for migrant shorebirds are the wide intertidal mudflats and marshes along the James and Hudson Bay coasts, where hundreds of thousands of birds gather. While certain areas are identified as holding larger concentrations, the entire shoreline is of importance at various times and as conditions change seasonally, annually, and over the years.

Apart from the north coast, birds tend to be widely dispersed and take advantage of many areas, even small ponds, marshes and flooded fields. The shores, mudflats, and swamps associated with ponds, sewage lagoons, rivers, and lakes, offer resting and foraging opportunities for migrants. The most important of interior shores are those associated with the southern Great Lakes. A few areas such as Presqu'ile Provincial Park, the western end of Lake Ontario, Long Point, Point Pelee onion fields and Hillman Marsh, and the fields and marshes near Lake St. Clair, are noted for some of the largest numbers of migrant shorebirds in the south (see Figure 3B). However, there is a need to more clearly identify the use and significance of many other areas that are used opportunistically by migrants (Pittaway 1999). In aggregate, these shores provide foraging sites for thousands of birds, but the full extent of passage migrant numbers in the south is not clear.

existing and potential threats to shorebirds and their environment

Shorebirds are subject to a wide range of threats throughout their life cycle, which can extend from the Arctic to South America. Several such stressors continue to affect shorebirds in Ontario. Most of these factors are directly related to human activity, and hence are felt most strongly in southern Ontario where most people reside. The greatest danger may arise from the cumulative impact of several threats operating in an area. Northern Ontario shorebirds have encountered minimal threats on breeding and staging areas. However, we may still be seeing the legacy of actions that reduced populations of migrants a century earlier, or continuing threats far away in other countries. Overarching all of these is climate change, the implications of which are not well understood.

Urbanization

Human population growth results in increased pressures on all forms of habitat, especially wetlands by encouraging drainage and through such activities as increased recreational use, the development of subdivisions and industrial parks, or conversion to agricultural uses. Increased housing development contributes to disturbance by people and their cats and dogs, along with contributing to enhanced populations of opossums, raccoons, foxes, coyotes, rats, and gulls, all of which prey on shorebird eggs and young, and even adult shorebirds. Increased predator populations may have contributed to the disappearance of the Piping Plover from the southern Great Lakes. Killdeer, and to some extent Upland Sandpiper and American Woodcock, are species that may have benefited in the past from human disturbance through agriculture and forestry; however, habitat loss through urbanization may be a significant negative influence now. Similar concerns may be appropriate for Common Snipe and Spotted Sandpiper.

Wetland Losses and Degradation

Significant wetland losses everywhere south of the Canadian Shield in Ontario have led to the disappearance of 83 percent of the original coastal and interior wetlands in the south-west, with losses approaching 95 percent in some counties (Snell 1987). Wetland drainage and conversion to agriculture have been major causes of wetland loss (Environment Canada 1991). Wetlands are also being degraded by invasive plants, use by livestock, and pollution.

Water flow, which has been severely altered by landscape settlement and development, has certainly affected Common Snipe and American Woodcock populations. Cover removal for farming, residential and industrial growth, or through forestry practices allows rapid runoff, affecting water quality by increasing sedimentation and contaminant flow. It also decreases infiltration of rainfall, diminishes groundwater reserves, lowers water tables, and decreases the watershed capacity to sustain dry-season water flow and marshland water levels (Riley and Mohr 1994).

Migrant shorebirds make use of every pond, marsh and swamp that offer food as thousands move across the land twice each year. We can only speculate on the effect that the loss of southern wetlands has had on use by migrants. Fortunately, there are still thousands of lakes, rivers, and ponds, and, in fact, some foraging habitat has also been provided by municipal sewage facilities. With restrictions currently in place on the destruction of some wetlands, they will continue to provide foraging opportunities; however, they are being degraded to some extent by introduced plant species and water level stabilization. Water levels maintained artificially high or low, rather than cycling naturally, decrease food resources and foraging opportunities for shorebirds and other waterbirds. The incremental loss of small wetlands, swampy woodlands, and sewage ponds will continue to erode the habitat base for migrants.

Wetland losses and degradation in northern areas have been minimal to date due to their remote location.

Shoreline Loss

Loss of shoreline habitat is particularly severe on the Great Lakes where encroaching development and shoreline stabilization activities continue to degrade shorelines. Also, seaway power dams and control structures, dampening yearly water cycles and reducing periodic shoreline exposure in particular have stabilized water levels of Lake Ontario. As well, there is intense recreational use of the shores – including recreational vehicles, joggers, walkers and their dogs, hunters, and even birders – leading to potential disturbance to shorebirds, which can limit their access to nesting and food resources and impact their physical condition. Beach clearing in recreational areas removes food sources and exacerbates the situation for both local and migrant shorebirds (Pomeroy 1999). Recreational use of sandy beaches of the Great Lakes has disturbed many areas formerly used by Piping Plovers, and contributed to their elimination from those shorelines.

Inland throughout much of southern Ontario, many lakes have experienced development pressures with the establishment of cottages and other recreational properties. Small wetlands have been filled, and shoreline areas have been rendered unusable for shorebirds and many other species. Cats, dogs, and other disturbances have interfered with birds. Dams have been built to stabilize water levels, often flooding beaches and wetlands. Current restrictions to shoreline alteration may be slowing these changes, but they still occur and remain a threat. Over a wide area, recreational canoeing and camping could interfere to some extent with species like Spotted Sandpipers.

Agricultural Practices

In general, agricultural land in southern Ontario is being used more intensively (Riley and Mohr 1994). There has been a steep decline in the area of pasture in southern Ontario – a 65 percent decline from 1921 to 1986, and a further 19 percent decline from 1986 to 1996 (Statistics Canada 1987, 1997). Pastures used by Upland Sandpiper, Killdeer, and American Woodcock are being converted to row crops that are not used to any extent by these species; this also reduces upland foraging opportunities for several migrant species (plovers, Buff-breasted Sandpiper).

Many old fields are planted with trees or allowed to regenerate to forest, or are developed as subdivisions or industrial parks, which eliminates American Woodcock habitat. The availability of fields to migrating shorebirds in spring has also been diminished in the south-west through conversion of large areas to hot houses for hydroponic production; currently, this is a local occurrence, with limited impact to date.

Killdeer / Mark Peck

Intensively farmed lands often depend heavily on chemical pesticides, herbicides, and fertilizers (Riley and Mohr 1994). These have the potential to contaminate shoreline areas and marshes, and the food eaten by several species using those habitats (Noble 1991, Environment Canada 1999).

Wet agricultural fields are favourite stopping places for migrant species like American Golden-Plover and Black-bellied Plover. Farmers often attempt to drain wet areas that might interfere with working the land. Wetlands may also be degraded through excess erosion on nearby farmlands, particularly where hillsides are worked.

Toxic Substances and Disease

Industrial effluents pollute areas such as Hamilton Harbour, and hundreds of synthetic chemicals have been found in Great Lakes waters, including persistent chlorine-containing organic compounds. These have been reduced substantially in recent years, but are still present in contaminated bottom sediments and are being added through atmospheric deposition and undetected direct sources (Ryckman et al. 1997). Runoff from urban areas carries a variety of chemicals into rivers, ponds, and lakes (Environment Canada 1999). Migrant shorebirds may be accumulating toxic loads by feeding in polluted waters and sediments on migration (Napolitano et al. 1992). The level of contamination or its effects on reproduction and survival are unknown (Noble 1991).

Recently, outbreaks of Type E Botulism have caused deaths of a variety of waterbirds along the shores of Lake Erie and southern Lake Huron. In 2002, a die-off of shorebirds due to botulism was reported at Long Point National Wildlife Area but the overall extent of the kill is not known. The birds probably contracted the disease by eating parts of infected fish or associated maggots.

Hunting

Unrestricted hunting was a serious threat to most shorebird species prior to the passage of the *Migratory Birds Convention Act* in 1917. Market hunters shot them in the millions, all but eliminating the Eskimo Curlew (Gollop et al. 1986) and greatly diminishing many other larger shorebird species. Today subsistence hunting in the north involves the opportunistic taking of a few of the larger species, the population effect of which is undetermined. The extent and effect of hunting in wintering areas also are unknown.

In Ontario, only American Woodcock and Common Snipe have a sport harvest. Annual Ontario harvest of American Woodcock has been declining slowly in recent years, from about 41,000 birds (Levesque and Collins 1999) in the early 1990s to 25,000 in 1999. This level of harvest is not known to be having any effect on the population but, given the general population decline in this species, its impact should be studied in concert with habitat loss studies.

Spotted Sandpiper / Mark Peck

The harvest of Common Snipe also has been declining slowly throughout Canada. In Ontario, it has dropped from about 5,000 birds annually in the early 1990s (Levesque and Collins 1999) to about 2,300 in 1999. Given that this is a generally common species, the population is likely sustainable at recent harvest levels: the decline in harvest is believed to be a reflection of the decreasing number of hunters.

Resource Extraction

In parts of northern Ontario, including the Hudson Bay Lowlands, there is high potential for development of copper, zinc, gold, iron, diamonds and uranium, and a variety of other mineral resources. Extensive peat deposits present another prospective development opportunity. To date, high exploration and development costs have limited activity and may do so for some time but there is potential for disruption, particularly to near-shore ecosystems, which could affect breeding shorebirds. Oil and gas have been identified as a potential resource in the north, but exploration has been limited to some areas along the Hudson Bay coast in the 1970s. Future exploration could affect shoreline areas of vital importance to migrants.

Timber harvesting, particularly intensive practices such as clear-cut logging, might affect boreal nesting species through habitat alteration, either directly by forest removal or by impacts to boreal wetlands through changes in water quantity and quality.

Hydroelectric Development

Long range hydroelectric development planning has identified several sites on major rivers draining into Hudson Bay and James Bay for future dams and reservoirs. These structures would flood large areas, affecting shorebird use and influencing downstream shores, islands, and estuaries as nesting areas. Water flow patterns would change in the bays, altering siltation patterns and salinity of near-shore areas, affecting invertebrate food populations. The potential negative effects on staging shorebirds could be significant, yet remain unstudied. There have also been proposals in the past to build a dam across James Bay for hydroelectric generation, a project that would destroy the shoreline area completely as breeding and staging habitat for shorebirds. Such development would have catastrophic effects on many species at a continental populations scale, including the isolated eastern population of Marbled Godwit found around James Bay.

Expanding Lesser Snow Goose Numbers

Changes in agricultural practices in the southern wintering areas have apparently contributed to an increase in mid-continent Lesser Snow Goose populations of about 5 percent per year since 1969 to reach numbers now totalling more than 4.5 million birds (Abraham et al. 1998, Abraham and Jefferies 1997). The northern coasts of Ontario are major staging areas for migrant Snow Geese (Bellrose 1980, Thomas and Prevett 1982). Hundreds of thousands of migrant geese use this area during both spring and autumn (Abraham et al. 1999). Moreover, the Cape Henrietta Maria colony holds more than 400,000 adults, increasing to over one million adults, non-breeders, and juvenile birds in late summer throughout Polar Bear Provincial Park. The breeding colony covers 400 square kilometres; more than 290 kilometres of coastal areas are used during the brood rearing stage. Cumulative effects of severe grazing and grubbing in marsh plant communities are evident in many places (Abraham et al. 1998). The extent that this use has affected breeding and staging habitat for shorebirds of all species has yet to be evaluated; however, noticeable declines in some breeding shorebird species have been noted at the La Perousse Bay Snow Goose colony in Manitoba, where geese have significantly altered near-shore habitats (Rockwell et al. in prep.).

Climate Change

Over the next century, global average surface temperatures are predicted to rise by 1.4 to 5.8°C (Dunn and Flavin 2002), a rate of 15 to 40 times faster than at any time in the past, bringing about major environmental changes (Smith et al. 1998). The most serious changes are likely to be felt in northern parts of the province. Various predictions include: permafrost melt in subarctic areas and a shift in boreal forests northward by as much as 500 kilometres; drying out of peatlands and forests that would then be subject to burning; a rise in ocean levels by three to eight centimetres per decade which could flood northern coastal marshes if isostatic rebound does not match the rise; a huge drop in freshwater levels in the Great Lakes that could severely affect shoreline marshes but may expose new foraging habitat; an increase in severe weather events that could result in flooded breeding habitats or losses of young to cold, wet weather; and an increase in diseases that may infect migrants, such as malaria and encephalitis. Many subarctic wetlands may shrink; shallow lakes and ponds could fill with vegetation. Changes in water levels, soil moisture, and temperatures will affect populations of benthic organisms, possibly changing available food supplies. Given the potential for both positive and negative effects, the full impact cannot be predicted at this time, but we need to monitor changes in order to develop such predictions and make plans for mitigation if possible.

priority needs for shorebird conservation in ontario

5.1 Introduction

This section sets out the science needs and management actions that are important to shorebird conservation in Ontario. These assessments help to define the priorities for action, thereby directing activities that will maximize coordination and minimize duplication of effort. Conservation initiatives are presented in three sections:

- **Population and Distribution Characteristics.** This section outlines research needs to develop an understanding of the size of populations, trends in numbers, and the distribution of species in time and space; these studies will contribute to the Program for Regional and International Shorebird Monitoring (PRISM), which is the work of a Canada-United States committee to ensure consistent and effective survey and monitoring activities.
- **Habitat Relationships.** This section sets out the requirements for defining the habitat needs of shorebirds.
- **Conservation and Management.** This section outlines actions, based on population and habitat information, which will make meaningful contributions to shorebird conservation in Ontario.

Within each of these three sections, information is divided between breeding and migrant shorebirds. A general priority rating and BCR location are assigned to each component.

5.2 Science

5.2.1 POPULATION AND DISTRIBUTION CHARACTERISTICS

Breeding Shorebirds

Science needs with respect to numbers and distribution of breeding shorebirds in Ontario are:

1. To determine breeding distributions and develop accurate estimates of population size and trend. Much of northern Ontario is without road access and the number of places that fixed-wing aircraft can land is limited, making access difficult and costly. As a result, there has not been an accurate assessment of the population size or the full extent of the ranges of shorebirds that breed in this area. Such information is crucial in assessing a species' conservation priority. Development of the methodologies to do this forms a major component of PRISM, and will involve cooperation among many agencies, including those outside of Ontario. **(High Priority)**

   Species priorities are assigned as follows:

   A. **Species known to have relatively low population levels with potentially high proportions of their populations or isolated sub-populations breeding in Ontario.** The Hudsonian Godwit, which has in the past been considered rare in Ontario, may have as much as one quarter of its Canadian breeding range in the province making it of high regional conservation importance. The size of the isolated James Bay Marbled Godwit population is also unknown, but appears to be relatively small. Questions need to be addressed regarding why it is not more numerous, its taxonomic status, and its winter distribution. **(High Priority – BCR 7)**

B. **Southern breeding species that are subject to greater anthropogenic impacts.** While southern breeding shorebirds were often encouraged initially by human-induced changes, they are now facing potentially serious declines as land uses change with further human population expansion. Related pressures enhance the need for continual monitoring to identify threats in this part of the province. At the same time, the large population and the accessibility of the area offer the greatest potential for volunteer-based surveys, which could greatly improve our knowledge of shorebird populations. As none of the six species that nest widely in southern Ontario do so exclusively there, surveys and monitoring in southern Ontario must be coordinated as much as possible with those in the northern part of the province, to assess relative changes and overall numbers. Priority species in this group include the American Woodcock and the Upland Sandpiper, both of which appear to be declining in abundance. **(High Priority – BCR 12, 13)**

C. **Species known to have a significant proportion of their breeding populations in Ontario.** The Hudson Bay Lowlands in particular and, to a lesser extent, the boreal forest areas across the province provide for a large proportion of the Canadian populations of Greater Yellowlegs, Lesser Yellowlegs, and Solitary Sandpiper. There are no estimates of population size as these species are widely dispersed in inaccessible areas during the nesting season, particularly the yellowlegs, and there is little information on the extent of occupation within the province. The Solitary Sandpiper does not congregate anywhere in large numbers, and breeding density estimates may be best gathered during other operational surveys (e.g., annual breeding waterfowl counts and the Ontario Breeding Bird Atlas 2001-2005). **(Medium Priority – BCR 7, 8, 12)**

Solitary Sandpiper / Mark Peck

D. **Arctic-breeding species with substantial but undetermined parts of their breeding range in the province.** The ranges of several Arctic-nesting shorebirds extend into Ontario and significant numbers of Semipalmated Plover, Semipalmated Sandpiper, Dunlin, Stilt Sandpiper, and Red-necked Phalarope may breed here. However, there are no adequate estimates of the numbers of these species in the province, or the importance of this segment of the population to the overall Canadian population. **(Medium Priority – BCR 7)**

E. **Secretive species likely with low abundance.** The Hudson Bay Lowlands of Ontario lie between the two nesting areas of separate subspecies populations of Short-billed Dowitcher. Until fairly recently, it was not even recognized as a breeding bird here, and is surmised to be very rare. A difficult species to find and study, its status in the province might be quite underestimated. **(Medium Priority – BCR 7)**

F. **Other shorebird species nesting in northern Ontario.** There is a need for better understanding of overall population sizes and ranges for most species in order to assess their conservation priority in the province. **(Medium Priority – BCR 7, 8)**

Red Knot on migration (James Bay) / Guy Morrison, Canadian Wildlife Service

2. To monitor population trends of species sampled during various spring surveys, either volunteer or agency-based. Priority should be given to analyzing these data and improving the surveys where possible. Surveys would include the Breeding Bird Survey, Forest Bird Monitoring Program, Marsh Monitoring Program, Black Duck Survey, and Spring Woodcock Survey. **(High Priority – BCR 8, 12, 13)**

3. To examine population dynamics in order to identify and monitor indices of production and mortality for those species whose populations are known to be declining significantly. There is presently little or no information on reproductive output, fledging success, or age-specific mortality for any populations of shorebirds breeding in Ontario. Therefore, it is not possible to determine if breeding factors are currently affecting those populations of concern. This information could be very important in the development and assessment of management programs. **(High Priority – BCR 7, 8, 12, 13)**

4. To undertake colour marking or telemetry studies to determine migration routes and wintering grounds of certain northern Ontario breeding species, such as the godwits and the yellowlegs. Migratory pathways followed by some species of shorebirds that nest in northern Ontario, and the areas where they stage and overwinter are largely unknown. Thus, it is not possible to assess the potential causes of declines that may result from factors outside the breeding range. **(Medium Priority – BCR 7)**

5. To document more completely the annual variation in numbers and distribution of the endangered Piping Plover. The Piping Plover may still breed in Ontario at least occasionally in two known locations in Lake of the Woods. As part of the recovery plan for this species, a search of all possible nesting areas will be conducted and monitoring of its occurrence will continue (Goossen et al. 2002). **(High Priority – BCR 12, 13)**

6. To identify areas with highest breeding densities of certain species. Priority should go to species with the largest proportion of their ranges in southern Ontario and facing the greatest probability of decline (Upland Sandpiper, American Woodcock) due to anthropogenic impacts. Identifying the areas of highest breeding potential provides crucial information on habitat relationships, and helps to identify priority locations for conservation action. **(High Priority – BCR 13)**

Migrating Shorebirds

Science needs with respect to numbers and distribution of migrating shorebirds in Ontario are:

1. To assess fully the importance of the Hudson and James Bay coasts to migrating shorebirds in both spring and autumn. Although the northern coasts are very important migration areas for shorebirds transiting between the Arctic and wintering areas in Central and South America, previous surveys have provided incomplete estimates of their use because of difficulties in covering the full coasts or in surveying at optimal times. There is a need for much better information on the numbers and distributions of each of the major migrant species using the north coasts to focus conservation action and to contribute to assessing population sizes and trends for these birds in a global perspective. **(High Priority)**

   Specific information needs in order of priority are as follows:

   A. To determine peak numbers and distributions of the major staging species using the coasts by means of dedicated aerial surveys. Such work, which could employ digital counting techniques, should focus initially on the autumn period when higher numbers are anticipated and staging is more protracted. These surveys may contribute to population monitoring of high priority species including Hudsonian Godwit, Marbled Godwit, and Red Knot. **(High Priority – BCR 7)**

   B. To estimate the total numbers of shorebirds using the coasts by studying turnover rates of the major staging species. This work would require use of marking or radio telemetry techniques along with routine banding, and would necessitate the establishment of field stations in areas of high shorebird staging concentration. **(Medium Priority – BCR 7)**

   C. To determine the sex, age class, linear dimensions, and weight of birds present at various times and relate these to turnover rates. This information will provide useful means of monitoring species productivity and staging habitat quality, as well as providing information on subspecies. Some of this can be undertaken through reanalysis of older data sets using more modern statistical techniques. **(Medium Priority – BCR 7)**

2. To assess the importance of southern Ontario to migrating shorebirds by determining shorebird use of a statistical sample of appropriate habitats throughout the area during peak migration, and applying these usage levels to estimates of the total amounts of the various habitat types. Shorebirds migrating through southern Ontario use a wide variety of different habitats, in a multitude of different places. The importance of the various habitat types is not understood, nor is the aggregated impact of these as potentially useful migratory stop-overs that may be available, even briefly or irregularly. This information would help determine the emphasis in conservation actions, whether broad-based or site specific. Such work might be undertaken in cooperation with the Ontario Breeding Bird Atlas project; some volunteers could survey shorebird use outside of the breeding bird survey time period on their assigned plots. **(High Priority – BCR 13)**

3. To assess the impact of the harvest of shorebirds on population trend. The National Harvest Survey for American Woodcock and Common Snipe should be maintained. The influence of native harvest on the Marbled Godwit population should also be examined. **(High Priority – BCR 12, 13)**

4. To improve the monitoring of shorebird migration with more frequent and widespread assessment of numbers through expansion of the Ontario Shorebird Survey. This and related surveys throughout North America and the Caribbean provide the only coordinated means of monitoring population trends of a wide range of shorebird species. Ontario provides an important contribution as it is one of the few inland areas monitoring shorebird migration. **(High Priority – BCR 12, 13)**

5. To determine the degree of repeat use by shorebirds of particular areas in southern Ontario to establish whether they are traditional stop-over sites used by specific individuals, or are used on a more random and opportunistic basis by migrants. This information would also help direct habitat management strategies. **(Medium Priority – BCR 13)**

6. To establish the breeding origins and wintering destinations of staging shorebirds through a variety of marking and analysis techniques. There is limited information on migratory pathways followed or specific wintering areas occupied in order to evaluate potential causes of decline operating outside the breeding range. Such information is also useful in fostering partnerships in conservation. **(Medium Priority – BCR 7)**

5.2.2 HABITAT RELATIONSHIPS

Breeding Shorebirds

Science needs with respect to habitat relationships of shorebird species breeding in Ontario are:

1. To determine precise breeding habitat associations and identify those features crucial to shorebird populations. For most species of breeding shorebirds, only a general idea of the habitats chosen by each is known. Knowledge of the specific requirements of each species is necessary to assess the availability of such habitats, and identify the potential impacts; this is recognized as an important component of PRISM. This is particularly important for species with limited distributions (tree-line and tundra areas), and those that may be affected over large portions of their breeding range by large-scale activities (e.g., urbanization, agricultural and forestry harvest practices). Remote sensing with intensive ground-truthing could play a major role (e.g., Morrison 1997, Gratto-Trevor 1996). **(High Priority – BCR 7, 13)**

2. To determine present and potential threats to breeding habitats and assess the likely effects in the short and long term. Emphasis should be placed on existing threats, such as goose overabundance, urbanization, agricultural and forestry practices, and the presence of toxic substances. This work will require cooperation throughout the hemisphere to be effective. **(High Priority – BCR 7, 8, 12, 13)**

3. To identify all appropriate breeding habitat remaining for Piping Plovers in Ontario. This information is necessary in case recovery techniques such as re-introduction are to be considered. **(High Priority – BCR 12, 13)**

Hudsonian Godwit / Mark Peck

Migrating Shorebirds

Science needs with respect to habitat relationships of shorebird species migrating in Ontario are:

1. To determine the importance of specific James and Hudson Bay shoreline habitats through studies of temporal and spatial variation in invertebrate resources in response to salinity and substrate. The inflow of fresh water from the many rivers has important influences on the salinity of waters near river mouths, and this in turn affects invertebrate populations. Silt loads carried by major rivers and distributed by currents along the shores of the bay also have an impact on invertebrate populations. An understanding of the patterns and effects of the river inflow is necessary to evaluate the influence of potential changes in those patterns on shorebird staging (e.g., through possible hydro-electric developments). **(High Priority – BCR 7)**

2. To examine the present and potential threats to the carrying capacity of the James and Hudson Bay coastal zone caused by goose overabundance. Very high Lesser Snow Goose numbers have caused major disturbances in sediments and marshes along the bay shores. How these activities might be affecting invertebrate populations is largely unknown. The short-term and long-term consequences of such disturbance needs to be assessed in conjunction with other influences like isostatic uplift and climate change. **(High Priority – BCR 7)**

3. To determine the available food resources in various types of habitats to assess their potential value to migrating shorebirds. It is not known if stopover sites in southern Ontario are important to providing fat reserves for long migratory flights, or if birds are merely maintaining their weight prior to making short flights. In conjunction with determining the rate of passage of shorebirds, there is a need to estimate the food reserves present, the use made of those reserves, and the importance of small habitat patches to the energy needs of migrant shorebirds. The role and contribution of sewage lagoons as habitat for migrating shorebirds should be more thoroughly assessed. **(High Priority – BCR 13)**

4. To examine the possible effects of environmental toxins on migrating shorebirds. Some of the migrating shorebirds stopping in southern Ontario are feeding in polluted or potentially polluted waters and sediments. The impact of contaminants on shorebirds has never been thoroughly investigated in Canada (Noble 1991). **(High Priority – BCR 13)**

5. To examine the effects of habitat loss on migrant shorebirds in southern Ontario, as a result of a variety of identified stressors. It is unknown if shorebirds have suffered significant habitat losses in southern Ontario that may be influencing population levels, or if there is more habitat still available than required for the numbers of migrants that use the area. Could migrant shorebird populations be enhanced if more habitat was available in southern Ontario? **(Medium Priority – BCR 13)**

6. To determine the use of invertebrate resources by shorebirds through detailed feeding studies along the James and Hudson Bay shores. Although there have been some studies of the invertebrate resources of northern coastal areas, more extensive work is needed to establish more specific links to the distributions and feeding habits of shorebirds; moreover there is the opportunity to examine long-term temporal changes through comparisons with the earlier work. Dynamics of shorebird distribution on the bays must be examined in light of seasonal and annual variations in availability and distribution of invertebrates in various habitats. **(Medium Priority – BCR 7)**

7. To assess the potential impact of sea level rise on habitat availability for migrant shorebirds along the James Bay and Hudson Bay coasts, taking into account the influence of isostatic rebound. This would be a modeling exercise approached through the analysis of long-term remote sensing databases. **(Medium Priority – BCR 7)**

5.3 Conservation and Management

Given a better understanding of shorebird population numbers and trends, their distribution, and specific habitat associations, we can improve the quality of our recommendations for management. In the meantime, it is still possible to make meaningful contributions to shorebird conservation in a variety of ways, by making use of existing knowledge.

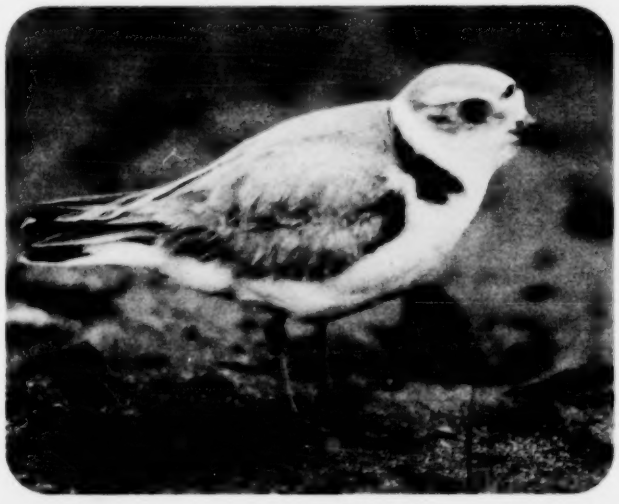
The conservation of shorebirds in northern Ontario should focus particularly on the coastal area of Hudson Bay and James Bay. Were the available resources to be seriously altered it could have disastrous results for numerous species, both local breeders and migrants. It is essential that the Cree people who are the most closely associated with northern coasts, and who make the most use of these areas, be active participants in the conservation and management activities for shorebirds there.

In southern Ontario, there is considerable anecdotal evidence that shorebirds once occurred in far larger numbers as migrants (Quilliam 1965, Smith 1998). Given that there is increasing evidence of a continuing gradual decline in the numbers of most shorebird species in recent years, the general loss and degradation of habitats available to shorebirds there may well be contributing to such declines. There is a need not only to maintain the quantity of the remaining available habitat, but preferably to enhance that habitat for both migrant and breeding shorebirds in southern Ontario.

Conservation and management needs for breeding and migrating shorebirds in Ontario are:

1. To develop an inventory of sites used by migrating shorebirds in southern Ontario. Emphasis should be placed on the most frequently and heavily used habitats. This work should be linked to WHSRN and the IBA program. **(High Priority – BCR 13)**

2. To determine appropriate conservation actions to respond to identified existing and potential threats to habitats. Priority should be assigned to the most imminent and serious threats, to areas with high diversity of shorebirds, and to areas with the highest concentrations of species of concern. An important component of these approaches should involve landowner participation in which stewardship agreements are developed with landowners to protect significant shorebird habitat, and to enhance food resources for migrating shorebirds. This is particularly important in southern Ontario where a large proportion of land is owned by private individuals or corporations. The conservation of shorebirds depends to a considerable extent on landowner cooperation. The large numbers of people there provide both constraints and opportunities to effect management approaches to the conservation of breeding shorebirds. **(High Priority – BCR 12, 13)**



Piping Plover / Mark Peck

3. To contribute to government land use policies, and to policy development of all major land-user groups where possible, to encourage shorebird conservation. Policies pertaining to wetland conservation and restoration, water quality and quantity, and agricultural practices should be targeted and should include conservation guidelines for small wetlands currently not viewed as provincially significant. **(High Priority – BCR 7, 8, 12, 13)**

4. To contribute to government resource development policies and regulations, especially to timber harvest management plans as they may affect shorebirds nesting in wooded areas, particularly boreal forest wetlands. **(High Priority – BCR 8, 12)**

5. To participate in the development and implementation of recovery plans for shorebird species at risk, such as Piping Plover. **(High Priority – BCR 12, 13)**

6. To contribute shorebird conservation components to management plans of provincial and national parks, national wildlife areas, and various other wildlife reserves. Such a contribution is particularly important to the plans for Polar Bear and Presqu'ile Provincial Parks. Similarly, shorebird conservation should be considered where appropriate in management plans by non-government organizations for wetlands on private property. **(High Priority – BCR 7, 8, 12, 13)**

7. To formally protect important areas for both breeding and migrating shorebirds through inclusion in reserves and parks and, where this is not immediately possible, to encourage protection and conservation of these areas through designation under programs such as the WHSRN, IBAs, heritage coastlines, and other possible allocations. Highest priority for action goes to the James and Hudson Bay coasts where a relatively narrow strip of coast with intertidal mudflats and marshes, and adjacent open marshes, ponds and ridges, provide a crucial link in the annual cycle of migrant shorebirds; providing full protection by annexing these shorelines to Polar Bear Provincial Park should be considered. Important sites having lower priority have been identified in southern Ontario where other means of securement/stewardship may be more effective; these would include private conservation acquisitions, conservation easements, community conservation plans (e.g., IBAs), and stewardship agreements. Present focus should be on unprotected wetlands associated with the southern Great Lakes shoreline, and on the Point Pelee onion fields and St. Clair Flats. **(High Priority – BCR 7, 13)**

8. To undertake experimental habitat management activities to find cost-effective techniques to enhance foraging opportunities for migrating shorebirds. As much as possible, these techniques should be optimized with those for other species groups such as waterfowl and marsh birds, and should follow an adaptive management approach. Experimental management should also be conducted in an assessment framework so that real incremental benefits can be separated from apparent benefits (e.g., redistribution). Naturalist groups could play a very useful role in this assessment component. **(High Priority – BCR 13)**

9. To monitor hunting pressure on American Woodcock and Common Snipe, and relate harvest to abundance, population size and trend, and habitat availability; make regulation changes if required. **(High Priority – BCR 12, 13)**

10. To develop educational initiatives to increase public awareness of shorebirds and the potential influences of human activities on shorebird numbers and habitats. A priority would be the development of a shorebird component to the Hudson Bay Lowlands environmental studies curriculum developed with First Nations through the EHJV. This could take place as part of the Shorebirds Sister Schools program (U.S. Fish and Wildlife Service). **(Medium Priority – BCR 13)**

communication

The OSCP forms part of the continent-wide implementation goals of the Canadian and United States Shorebird Conservation Plans. Within this comprehensive approach, the OSCP seeks to develop communication tools to enhance public understanding of the biology of shorebirds throughout their annual cycle, to present an overview of what is known and needed with respect to shorebird biology and conservation in the province, and to indicate the importance of Ontario to international conservation efforts for shorebirds. The formal adoption of the OSCP should be followed by the development of a comprehensive communications strategy aimed at specific target audiences, done in cooperation with other shorebird initiatives, including the national plans and WHSRN.

Target audiences for which the information presented in the OSCP will be of particular relevance include:

- Environmental managers in provincial and federal governments, and private organizations involved in shorebird conservation and/or management of water resources, wetlands, and other lands with shorebird habitat.
- Landowners and lessees of private or public lands that provide shorebird habitat, and who manage for agricultural, recreational, or forestry use.
- Elected representatives in local, provincial, and federal governments responsible for decisions affecting shorebirds and their habitat.
- Public individuals and groups with an interest in wildlife conservation, including local communities, tourism associations, educators, students, clubs, tourists, and birders.

Key messages to be conveyed include:

- Shorebirds were once generally more abundant but now a large number of shorebird species are declining, including some that breed in and/or migrate through Ontario. One species (Piping Plover) is endangered.
- Shorebird populations are slow to recover as these species have small clutches, little renesting, and often have delayed age of first breeding. Small decreases in adult survival can have major effects on population size.
- Ontario provides substantial amounts of important and critical habitat for shorebirds. For some species, a large proportion of the global population is found here.
- Loss and degradation of habitat have the greatest negative impacts on shorebird populations in Ontario. Potentially, climatic change will have the greatest impact on habitat.
- Opportunities exist to expand and to improve conservation initiatives to enhance protection of shorebirds and their habitats through public policy and direct habitat initiatives.
- Habitat conservation practices on both public and private lands offer significant potential to provide improved shorebird breeding and staging habitat.
- Community and landowner support for and participation in shorebird conservation are essential, and can result in local economic benefits.
- A similar conservation initiative has been successfully applied to waterfowl through NAWMP, and has been shown to benefit landowners and bird populations. This approach is being developed for many other species groups through initiatives such as PIF, IBAs, Canadian Landbird Monitoring Strategy, and the Canadian Colonial Waterbird Conservation Strategy. NABCI will provide overall coordination.

implementation

7.1 Introduction

Implementation of the OSCP provides an opportunity for federal and provincial governments, non-government organizations, industry, and landowners to build on existing partnerships and to foster new ones. A coordinated approach will reduce costs and deploy a larger effort across a greater area. Partnerships will be created by matching partners' strengths in research, monitoring, habitat protection, wetland and upland management, marketing, environmental education, communication, and public policy development. The expansion of existing partnerships will avoid the duplication of efforts and lead to more innovative support for shorebird conservation.

7.2 Partnerships and Linkages

Shorebirds in Ontario form only a component of hemispheric populations and, as such, efforts must be coordinated with conservation activities elsewhere in their breeding, migration and wintering areas. Effective shorebird conservation requires partnerships with broader linkages to other Canadian programs and agencies, and through initiatives such as WHSRN, with other countries visited by these birds. Links to shorebird conservation initiatives implementing the United States and Mexican national plans are also essential. These links with partners in other parts of BCRs 7, 8, 12 and 13 are essential to maximize the effectiveness of conservation actions, and to ensure that parallel actions are taken in neighbouring areas. These BCR linkages must be based on firm networks of contacts with willing partners, implemented through functional two-way exchanges. Technical information must flow in both directions; sharing funding and human resources among agencies is also needed to achieve the goals of the plan. These linkages come together under the framework of NABCI, predicated on developing partnerships for the conservation and habitat management of all bird species using the most expeditious approaches and combinations of partners to effect specific priority actions. Linkages are also needed with other NABCI conservation initiatives, such as PIF (focuses on songbirds and other landbirds) and WOW (addresses seabirds and colonial waterbirds), because many habitats used by shorebirds are key components of biodiversity in Canada and are important to other bird species.

Checking mist nets at dawn / Guy Morrison, Canadian Wildlife Service

The following are examples of how partnerships are contributing to shorebird conservation in Ontario:

Habitat Conservation

In Ontario, most wetland and upland securement, enhancement, restoration, management and stewardship activities are undertaken by partners of the EHJV. With the advent of the NABCI, the mandate of the EHJV has been expanded to include all native North American birds and their habitats.

To facilitate NABCI, the natural habitats of the continent have been mapped into 67 BCRs. Integrated planning across jurisdictions and across borders is currently underway for many BCRs utilizing these ecologically-based units as a common language (Figure 1). In Ontario, integrated biological planning for waterfowl, waterbirds, landbirds and shorebirds has begun in BCR 13 (Lower Great Lakes/St. Lawrence Plain), which extends into Québec and four American states. Although preliminary, the important shorebird areas for this BCR have been mapped using known IBA and WHSRN site information and other available expert data. These areas will be subsequently overlaid with priority areas for other birds to illustrate, among other things, where conservation activities could benefit the greatest number of species.

This planning initiative is the first step in integrating the habitat conservation needs of shorebirds with those of other bird groups to help direct habitat conservation activities on-the-ground in a coordinated fashion. The introduction of a shorebird component into Ontario EHJV program activities should be very cost effective. Much of the habitat conservation work for shorebirds in the east will likely be done through the EHJV, which is taking a BCR approach to integrated planning for all birds.

Population Monitoring

Traditionally, shorebird populations have been monitored by volunteers who have undertaken systematic counts during the spring and autumn migrations. These programs, which represent the most basic form of partnership, were developed by Guy Morrison in Canada (Maritime Shorebird Survey – MSS) and Brian Harrington in the United States (International Shorebird Survey). The Ontario Shorebird Survey, which is an offshoot of the MSS, has provided much useful information on population trend and migrational phenology and will contribute to PRISM internationally. Specifically, monitoring efforts in Ontario will contribute information on breeding birds in arctic and boreal regions of North America as well as temperate, non-breeding shorebirds on migration. It is desirable to expand this program to take advantage of both the large pool of observers in Ontario and the increasing knowledge of habitat availability. These surveys could also be performed on demonstration areas of managed habitat for shorebirds to provide information for both assessment and population monitoring.

Ontario Breeding Bird Atlas

The current round of atlassing (2001-2005) for the second Ontario Breeding Bird Atlas, which itself is a partnership of various government and non-government bodies along with private cooperators, will provide an updated picture of breeding shorebird distributions and population changes. Moreover, the wide distribution of cooperators may provide the opportunity to inventory shorebird migration habitat, particularly in southern and central Ontario, and to assess use by migrant shorebirds of these areas.

Species at Risk

The new legislation, *Species at Risk Act*, which received Royal Assent in December 2002, contains a stewardship component for the development of partnerships with landowners to protect species at risk and their habitats on private property. While such actions should benefit the target species, they may well help other species if they share habitats, including shorebirds. As well, listed species such as Piping Plover should benefit from increased funding of recovery activities by various partners.

Surveys and Research

Intensive breeding and staging ground surveys, which are key components of the OSCP, are expensive and time consuming, particularly in remote areas. Such work is best accomplished by combining the resources, including personnel and facilities, of federal and provincial governments, in the manner of northern Canada Goose breeding ground surveys. Similarly, research priorities are best met through cooperative approaches among governments, universities, and non-government organizations in the environmental field, and would be facilitated through the international research committee associated with the national plans.

Educational Package on Shorebird Ecology

A project recently completed under the auspices of the Ontario EHJV program has been a school curriculum on the ecology of the Hudson Bay Lowlands, developed with the cooperation and guidance of First Nations. Given the hemispheric importance of the James Bay coast to shorebirds, the opportunity should be taken to further these partnerships and to expand on the shorebird component. Such knowledge would spur the conservation ethic in this important area and may assist in economic development through responsible eco-tourism.

7.3 Formation of Ontario Shorebird Advisory Committee

The immediate challenge facing the implementation of the OSCP will be the formation of an Advisory Committee. The primary function of this Committee will be to identify science issues, conservation initiatives, and specific research and management projects that will further the conservation of shorebird populations in Ontario. The structure of the Committee will facilitate an integrated approach to shorebird conservation efforts in Ontario, and will link to other regional and/or national habitat management committees as appropriate.

The core of the Committee will consist of biologists and managers with shorebird and habitat expertise from federal and provincial government departments and non-government organizations. Members from universities, other educational institutions, and aboriginal groups will be sought on an ad hoc basis. The roles and responsibilities of this Committee will include, but not be limited to:

1. Providing technical advice and recommendations of a regional nature to the NABCI-Canada Council and the National Working Group of the CSCP, to achieve the goals and objectives of the national plan;

2. Providing technical advice and recommendations to regional habitat management bodies (e.g., Ontario EHJV Steering Committee) and to policy setting processes;

3. Facilitating the implementation of projects in Ontario by:
   - integrating approaches that enable the transfer of expertise and knowledge between projects in different areas or concerned with different species;
   - advising on the analysis and interpretation of data both already available and being gathered;
   - developing linkages with other conservation initiatives which have the potential to impact on shorebird conservation;
   - performing periodic evaluations and reporting of progress towards the goals and objectives of the OSCP, and revising those goals and objectives as warranted.

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Drafting Committee

Ken Ross ..... *Chair, Canadian Wildlife Service*

Ken Abraham ..... *Ontario Ministry of Natural Resources*

Bob Clay ..... *Ducks Unlimited Canada*

Brigitte Collins ..... *Canadian Wildlife Service*

Jean Iron ..... *Ontario Field Ornithologists*

Ross James ..... *Gateways Centre*

Dave McLachlin ..... *Ducks Unlimited Canada*

Russ Weeber ..... *Bird Studies Canada*

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Yves Aubry ..... *Canadian Wildlife Service, Québec Region*

Debbie Badzinski ..... *Bird Studies Canada*

Richard Cotter ..... *Canadian Wildlife Service, Québec Region*

Loney Dickson ..... *Canadian Wildlife Service, Prairie and Northern Region*

Garry Donaldson ..... *Canadian Wildlife Service, National Office*

Rod Fowler ..... *Ducks Unlimited Canada*

Cheri Gratto-Trevor ..... *Canadian Wildlife Service, Prairie and Northern Region*

Kevin Loftus ..... *Ontario Ministry of Natural Resources, Eastern Habitat Joint Venture*

Margaret McLaren ..... *Ontario Ministry of Natural Resources*

Erica Nol ..... *Trent University*

Ron Pittaway ..... *Ontario Ministry of Natural Resources*

Mark Stabb ..... *Wildlife Habitat Canada, Wetland Habitat Fund*

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Table 1.

POPULATION TRENDS IN CANADA AND THE EASTERN UNITED STATES, AND CANADIAN CONSERVATION PRIORITY FOR 29 SPECIES OF SHOREBIRDS REGULARLY OCCURRING IN ONTARIO.

SPECIES[1]	Ontario Trend[2] 1976-1997	Quebec Trend[2] 1976-1998	Maritime Provinces Trend[2] 1974-1998	East Coast U.S.A Trend[2] 1974-1982	Canadian Conservation Trend Priority[3]
Black-bellied Plover	i	d	i	D	3
American Golden-Plover		d	d		4
Semipalmated Plover	d	D	d	d	2
Piping Plover*					5
Killdeer	d	D		d	3
Greater Yellowlegs	d	i		i	3
Lesser Yellowlegs	d	d		i	2
Solitary Sandpiper	d	d			3
Spotted Sandpiper	d	D	d		3
Upland Sandpiper		d			2
Whimbrel		i	i	D	4
Hudsonian Godwit		d	d		4
Marbled Godwit					4
Ruddy Turnstone		D	D	d	4
Red Knot		D	D	d	4
Sanderling	d	D	D	D	4
Semipalmated Sandpiper	D	D	D	d	3
Least Sandpiper	d	d	D	i	3
White-rumped Sandpiper		i	d		2
Baird's Sandpiper					2
Pectoral Sandpiper	d	i	i		2
Dunlin	i	d	(D)		3
Stilt Sandpiper					3
Buff-breasted Sandpiper					4
Short-billed Dowitcher	d	d	D	D	3
Common Snipe	(D)	D			3
American Woodcock					4
Wilson's Phalarope		d			4
Red-necked Phalarope		D			3

[1] Order and nomenclature follow AOU 1998.

[2] Adapted from Morrison et al. (2001a). D = decline $p < 0.01$; D = decline $p < 0.05$; (D) = decline $0.05 > p > 0.10$; d = decline ns; i = increase ns.

[3] From Donaldson et al. (2001). 5 = species highly imperiled, 4 = species of high concern, 3 = species of moderate concern, 2 = species of low concern, 1 = species not at risk.

* Included as a species that formerly nested commonly, and is currently endangered.

Table 2.

STATUS, SEASONAL OCCURRENCE, AND POPULATION TRENDS IN NORTHERN AND SOUTHERN ONTARIO, AND ONTARIO CONSERVATION PRIORITY FOR 29 SPECIES OF SHOREBIRDS COMMONLY OCCURRING IN THE PROVINCE.

SPECIES	Northern occurance & status[1]	Southern occurance & status[1]	Trend in southern Ontario[2]	Conservation Priority[3] North	South
Black-bellied Plover	s A	s a	i	M	M
American Golden-Plover	s b A	s a		M	M
Semipalmated Plover	s b A	s a	d	M	L
Piping Plover*	(b)	(s) ( ) (a)		H	H
Killdeer	s b a	s B a	d	L	L
Greater Yellowlegs	s B A	s a	d	H	L
Lesser Yellowlegs	s B A	s a	d	H	L
Solitary Sandpiper	s B a	s (b) a	d	M	L
Spotted Sandpiper	s B a	s B a	d	L	L
Upland Sandpiper	b	s b a	d?	L	M
Whimbrel	s b A	s a	d?	H	L
Hudsonian Godwit	s B A	(s) a		H	L
Marbled Godwit	s b a	(s) (a)		H	L
Ruddy Turnstone	s a	s a		M	L
Red Knot	s A	s a		H	L
Sanderling	s A	s a	d	M	L
Semipalmated Sandpiper	s b A	s a	D	M	L
Least Sandpiper	s b A	s a	d	M	L
White-rumped Sandpiper	s A	s a		M	L
Baird's Sandpiper	s a	(s) a		L	L
Pectoral Sandpiper	s b A	s a	d	M	L
Dunlin	s b A	s a	i	M	M
Stilt Sandpiper	s b a	(s) a		L	L
Buff-breasted Sandpiper	s a	(s) a		M	M
Short-billed Dowitcher	s b a	s a	d	L	L
Common Snipe	s B a	s B a	d	L	L
American Woodcock	s b	s B a	d?	L	M
Wilson's Phalarope	s b a	s b a	i	L	L
Red-necked Phalarope	s b a	(s) (a)		L	L

[1] From literature and expertise of drafting team and reviewers. S or s = spring, B or b = breeding, A or a = autumn; uppercase = abundant, lowercase = smaller numbers, ( ) = very small numbers to former.

[2] Selected species available in Ross et al. (2001), Dunn et al. (2000), and Levesque et al. (2001). D = decline $p<0.05$, d = decline ns, i = increase ns.

[3] From expertise of drafting team and reviewers, rated as High, Medium or Low.

* Included as a formerly more widespread breeder which is currently endangered.

Table 3.

BREEDING POPULATION STATUS, ESTIMATED POPULATION ORDER, DISTRIBUTION, AND PREFERRED HABITATS FOR 22 SPECIES OF SHOREBIRDS THAT BREED REGULARLY IN ONTARIO.

SPECIES	Status	Estimated Population Order	Distribution and Preferred Habitat
American Golden-Plover	Rare	Few 100s	Restricted to extreme northeast heath-lichen tundra
Semipalmated Plover	Uncommon	1,000s	Sand and gravel shores and ridges along and near the north coasts
Piping Plover	Endangered	< 10	Only 2 locations in recent years on wide sand and gravel beaches
Killdeer	Common	100,000s	Throughout, on pastures, shores, lawns, gravel pits, clearings, disturbed areas
Greater Yellowlegs	Common	10,000s	Widespread in Hudson Bay Lowlands and some boreal forest wetlands
Lesser Yellowlegs	Common	10,000s	Widespread in and near Hudson Bay Lowlands ponds, wetlands and clearings
Solitary Sandpiper	Common	10,000s	Across northern Ontario near forest ponds and wetlands
Spotted Sandpiper	Common	100,000s	Throughout on sand and gravel shores of lakes and rivers
Upland Sandpiper	Uncommon	1,000s	Pastures and grasslands, mainly in southern Ontario south of the Canadian Shield
Whimbrel	Uncommon	1,000s	Dry and wet tundra along Hudson Bay coast
Hudsonian Godwit	Uncommon?	1,000s?	Marshy meadows along tree-line adjacent to Hudson Bay coast
Marbled Godwit	Rare	Few 1,000s	Coastal marshes of the James Bay coast
Semipalmated Sandpiper	Uncommon	1,000s	Mainly in extreme northeast on wet and dry tundra
Least Sandpiper	Common	10,000s	Wet tussock tundra in the Hudson Bay coastal areas
Pectoral Sandpiper	Rare	100s	Rare to absent in wet tundra, possibly only in extreme northeast
Dunlin	Uncommon	1,000s	Wet tussock tundra near the Hudson Bay coast
Stilt Sandpiper	Uncommon	1,000s	Wet and dry tundra near the Hudson Bay coast
Short-billed Dowitcher	Rare?	100s?	Boreal bogs and fens, wet tundra near north coast, possibly inland also
Common Snipe	Common	100,000s	Marshes, fens, bogs, wet meadows, and tundra throughout the province
American Woodcock	Common	10,000s	Swampy woods and thickets near open areas in central and southern Ontario
Wilson's Phalarope	Rare	100s	Marshes and ponds with grassy edges in south, also southern James Bay and west Rainy River
Red-necked Phalarope	Uncommon	1,000s	Tundra ponds and marshes along Hudson Bay coast, mainly in the northeast

Table 4.

OCCURRENCE, STATUS, AND MAIN HABITATS OF REGULARLY OCCURRING MIGRANT SHOREBIRDS IN ONTARIO.

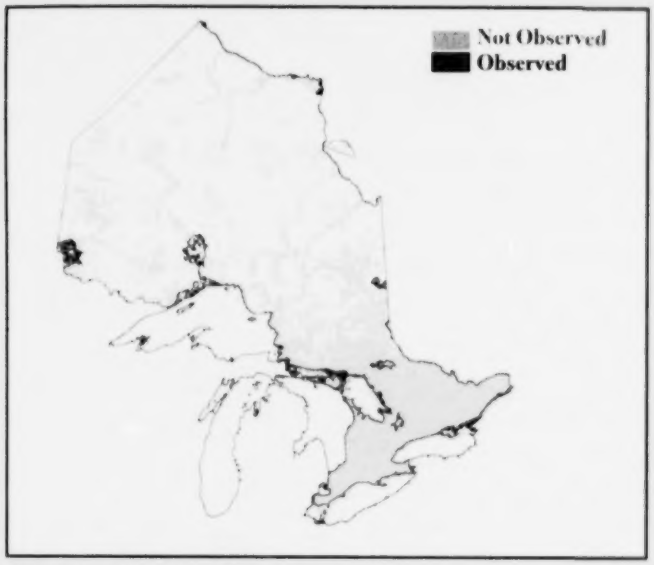
SPECIES	North A to VC[1]	North C to UC[2]	North Rare	South C to UC	South Rare	Habitats
Black-bellied Plover	+			+		Mudflats, beaches, fields, marsh
American Golden-Plover	+			+		Fields, beaches, mudflats
Semipalmated Plover	+			+		Beaches, mudflats
Killdeer		+		+		Open uplands, mudflats
American Avocet			+		+	Shallow water shores
Greater Yellowlegs	+			+		Mudflats, marshes, shores
Lesser Yellowlegs	+			+		Mudflats, marshes, shores
Solitary Sandpiper		+		+		Muddy margins ponds and rivers
Willet			+		+	Beaches, mudflats
Spotted Sandpiper		+		+		Sand, gravel, or muddy shores
Upland Sandpiper			+	+		Short grass uplands
Whimbrel	+			+		Coastal marsh, mudflats, beaches
Hudsonian Godwit	+				+	Intertidal mudflats, shores
Marbled Godwit		+			+	Coastal marsh, mudflats, shores
Ruddy Turnstone		+		+		Rock, gravel, and sandy shores
Red Knot	+			+		Mudflats, beaches
Sanderling	+			+		Sandy beaches, mudflats
Semipalmated Sandpiper	+			+		Beaches, mudflats
Western Sandpiper			+		+	Mudflats, beaches
Least Sandpiper	+			+		Mudflats, fields, marsh
White-rumped Sandpiper	+			+		Mudflats, beaches, fields
Baird's Sandpiper			+		+	Drier marshy edges and shores
Pectoral Sandpiper	+			+		Coastal marsh, fields, mudflats
Purple Sandpiper			+		+	Rocky shores
Dunlin	+			+		Mudflats, wet fields, beaches, mud
Stilt Sandpiper		+		+		Pools, mudflats, marshes
Buff-breasted Sandpiper			+		+	Coastal marsh, fields
Ruff			+		+	Marsh, mudflats, fields
Short-billed Dowitcher		+		+		Marsh, mudflats, shores
Long-billed Dowitcher			+		+	Mudflats, shallow pools
Common Snipe		+		+		Marsh, fen, fields, mudflats
American Woodcock		+		+		Wet woods and thickets
Wilson's Phalarope			+		+	Shallow lakes, ponds
Red-necked Phalarope		+			+	Open sea, ponds, lakes
Red Phalarope			+		+	Open sea, lakes

[1] A to VC = Abundant to Very Common

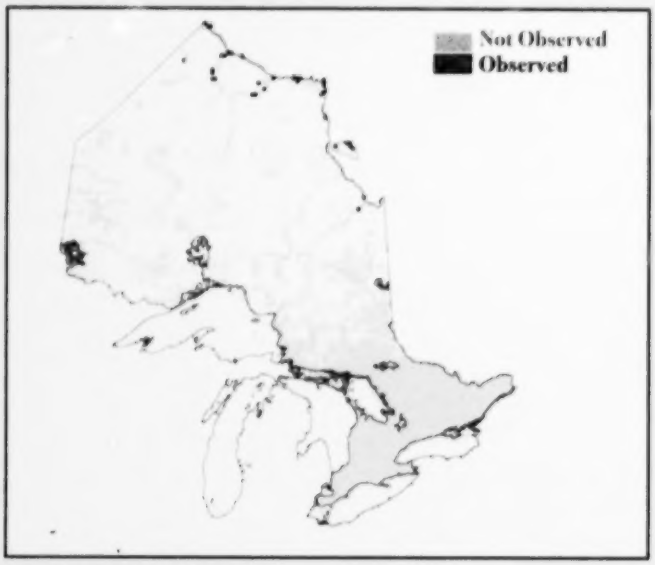
[2] C to UC = Common to Uncommon

appendix 1

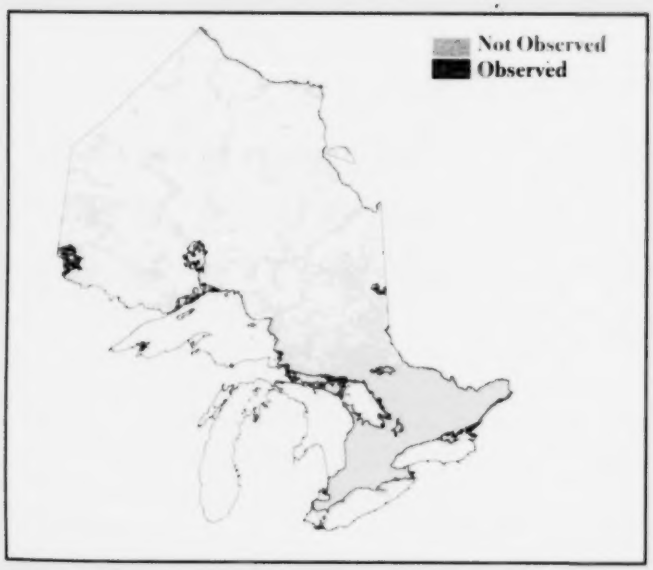
Breeding Evidence in Ontario (1981-1985) - from Cadman et al. (1987)



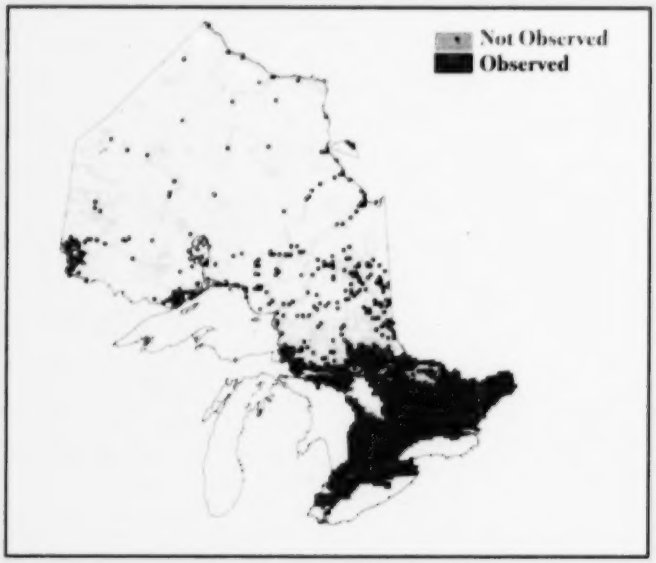
American Golden-Plover



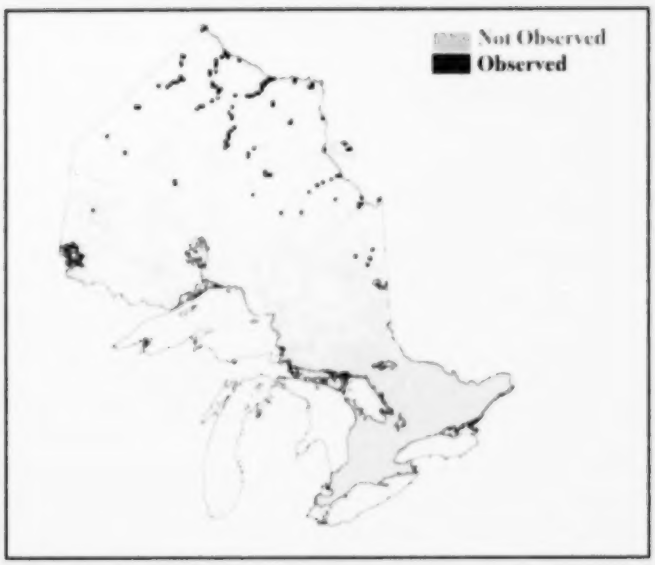
Semipalmated Plover



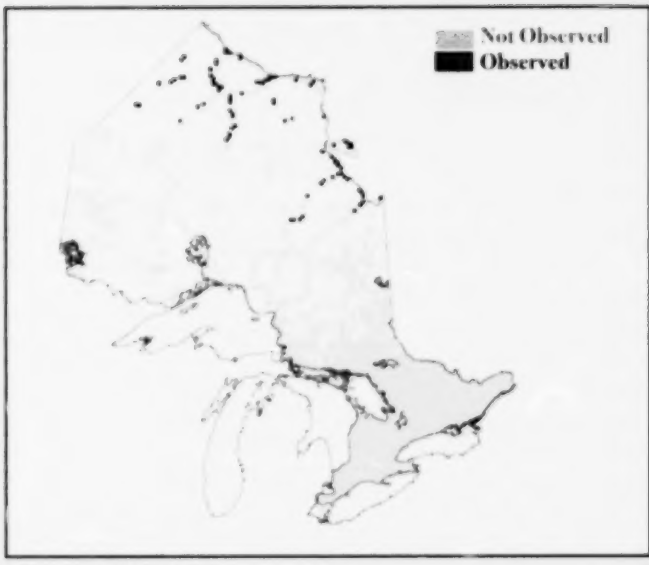
Piping Plover



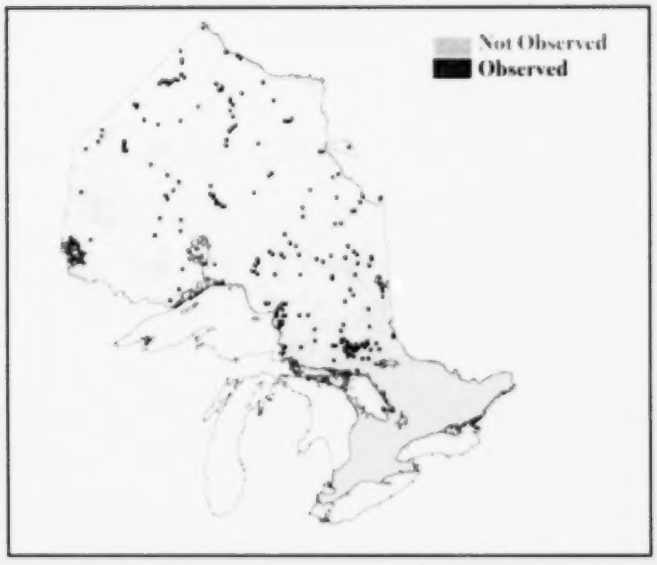
Killdeer



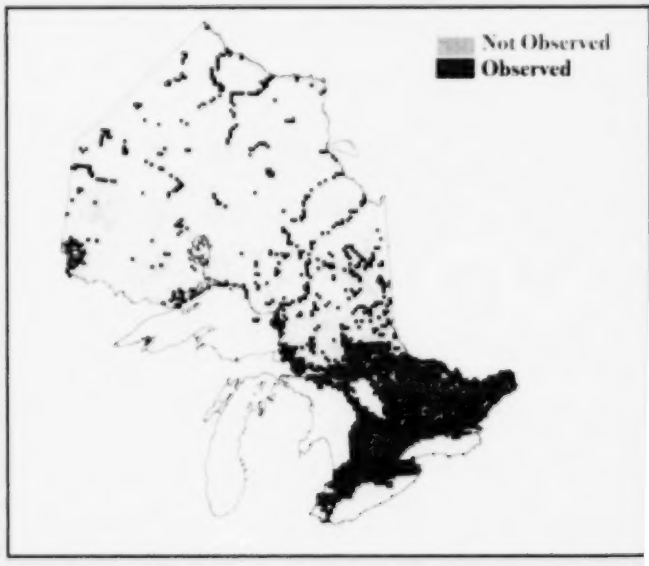
Greater Yellowlegs



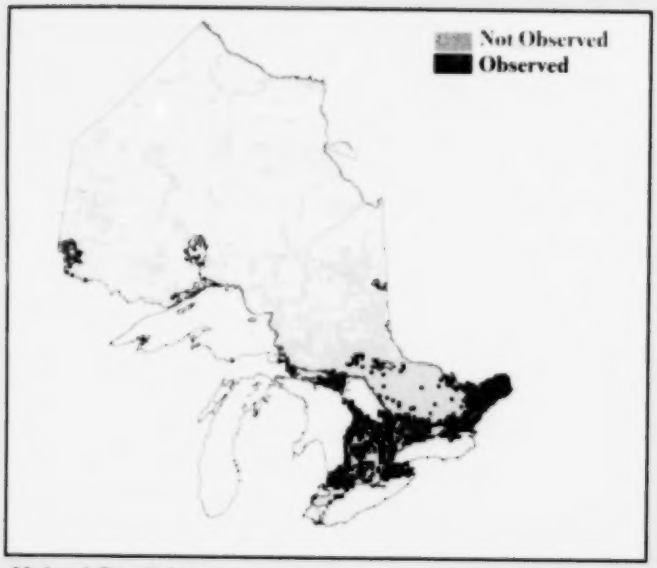
Lesser Yellowlegs



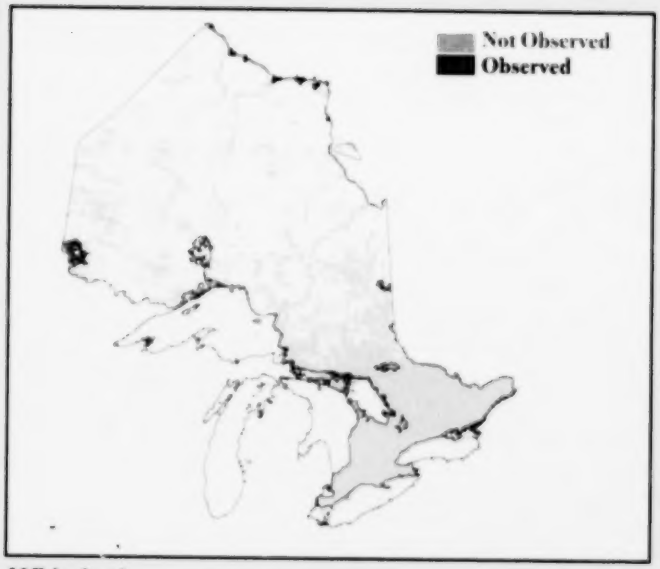
Solitary Sandpiper



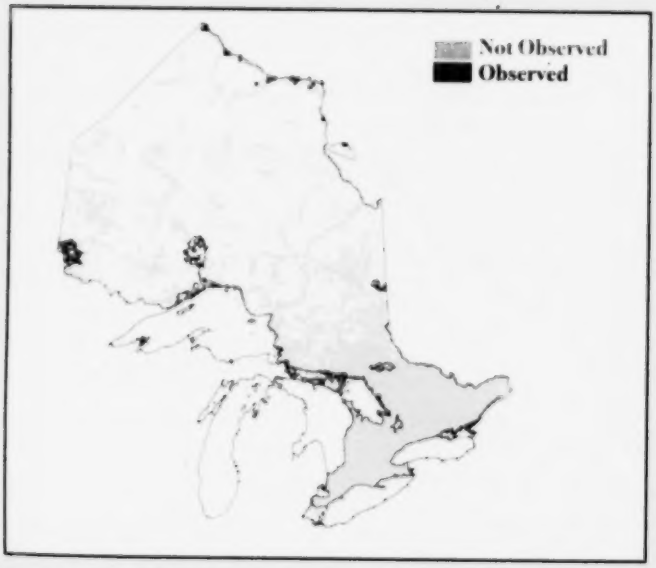
Spotted Sandpiper



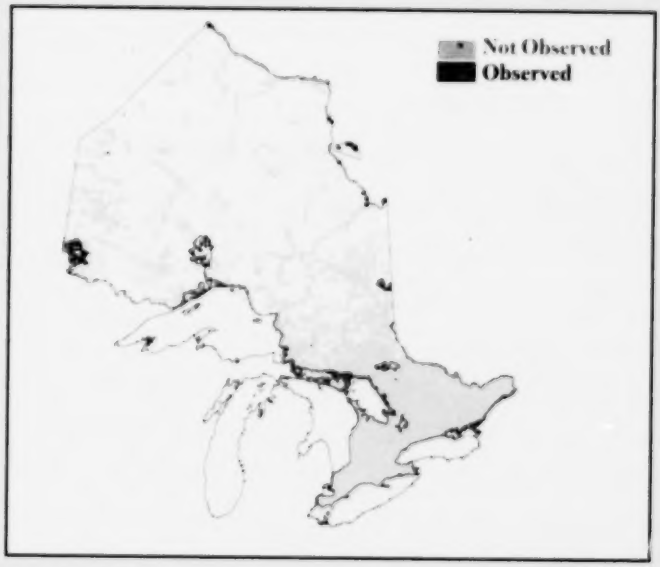
Upland Sandpiper



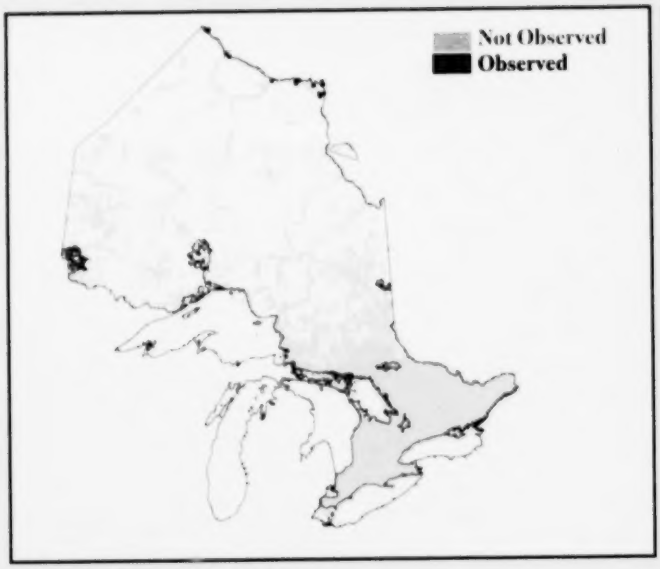
Whimbrel



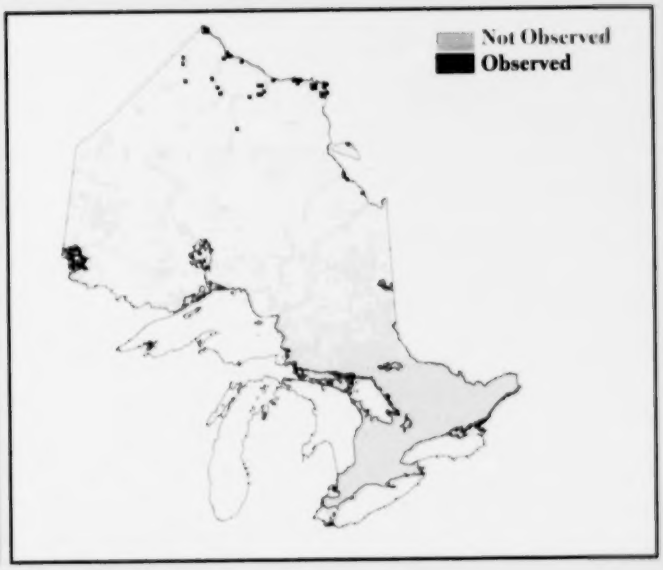
Hudsonian Godwit



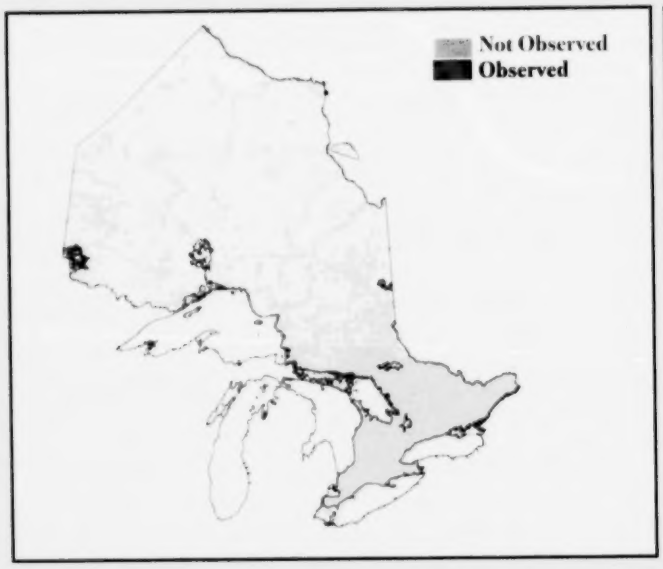
Marbled Godwit



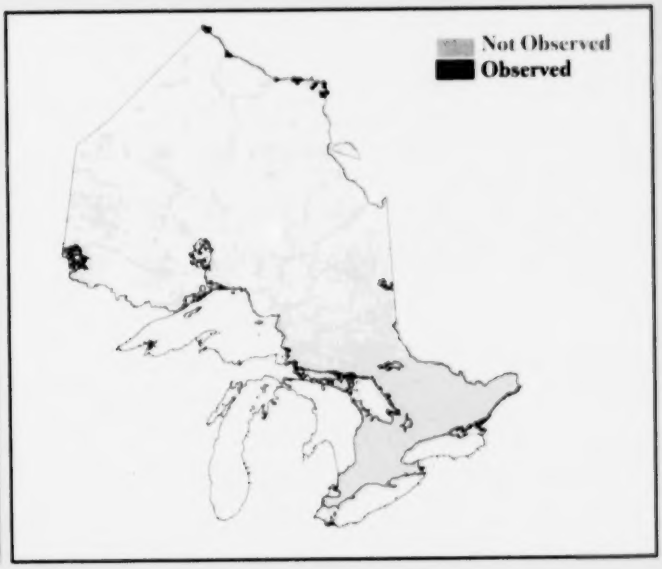
Semipalmated Sandpiper



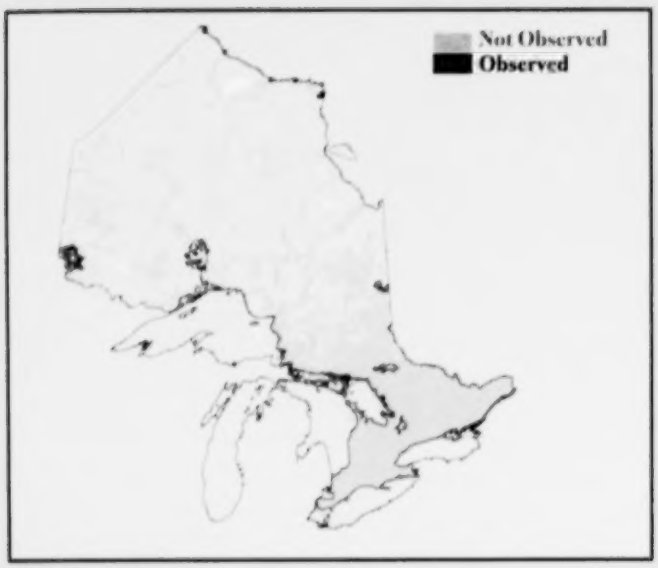
Least Sandpiper



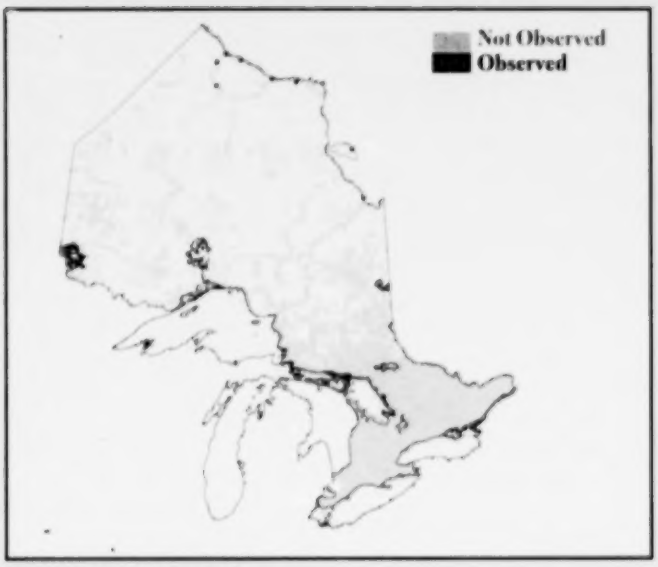
Pectoral Sandpiper



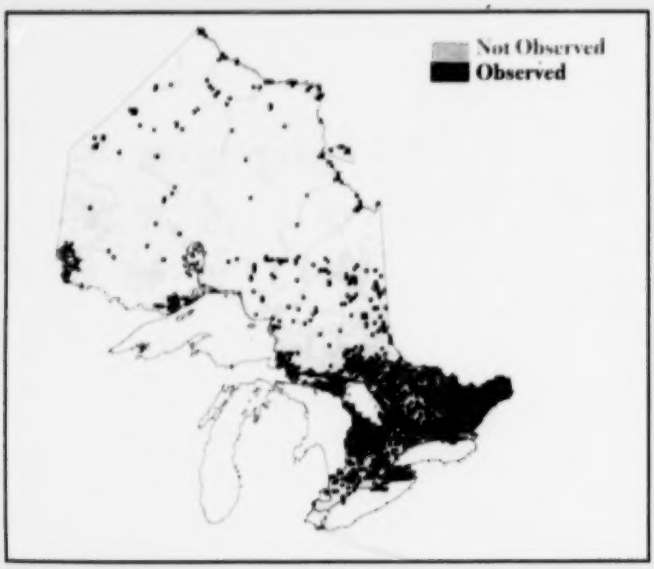
Dunlin



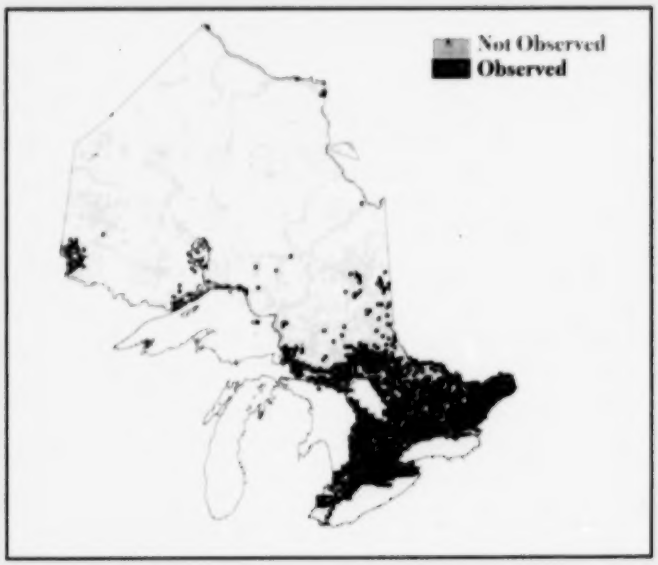
Stilt Sandpiper



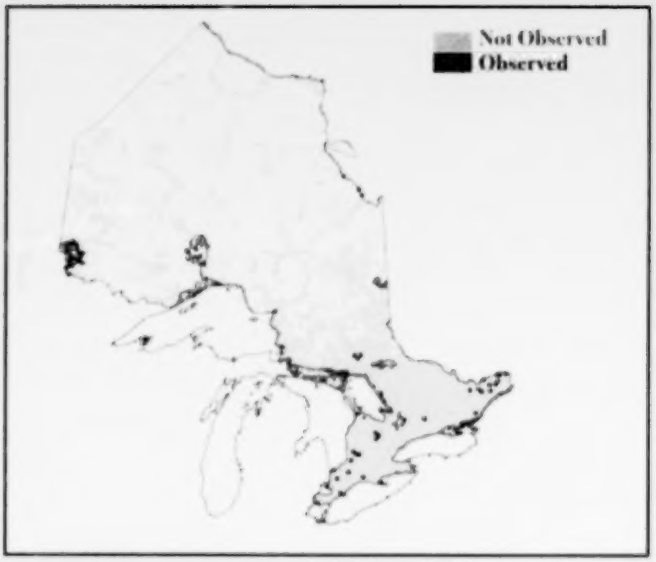
Short-billed Dowitcher



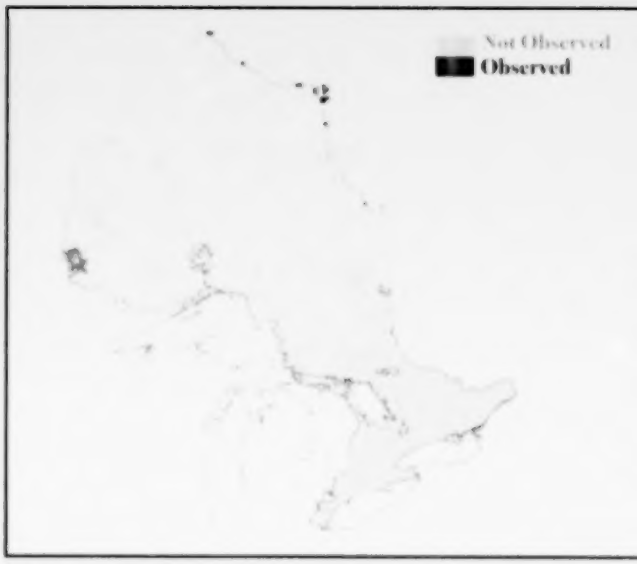
Common Snipe



American Woodcock



Wilson's Phalarope



Red-necked Phalarope

Upland Sandpiper chick / Ross James

appendix 2

Institutional Support for Shorebird Conservation

Migratory shorebirds are protected in Canada under the federal* Migratory Birds Convention Act *of 1917, and revisions in 1994. Primary responsibility for conservation of shorebirds is vested in the Canadian Wildlife Service, which has been a leader and partner in shorebird research and conservation actions in Ontario. The* Canada Wildlife Act *of 1973 makes provisions for the protection of wildlife and their habitats. Through provisions of the Act, many habitats have been protected, particularly for migratory birds. In addition,* A Wildlife Policy for Canada, *adopted in 1990 by the Wildlife Ministers Council of Canada, sets a goal of maintaining and enhancing the health and diversity of Canada's wildlife for its inherent value and for the benefit of future generations of Canadians, by maintaining and restoring ecological processes and biodiversity, and by ensuring that all uses of wildlife are sustainable (Canadian Wildlife Service 1990).

Project WILDSPACE™ (http://wildspace.ec.gc.ca) of the Canadian Wildlife Service, Ontario Region, maintains databases, a geographical information system and related decision support system for all surveys carried out by that agency. This system provides access to and analysis of shorebird data not only from dedicated surveys such as the Ontario Shorebird Survey but also from other surveys having incidental shorebird observations.

Similarly, the Natural Heritage Information Centre (NHIC) (www.mnr.gov.on.ca/MNR/nhic/nhic.html) of the Ontario Ministry of Natural Resources maintains a database with reports of rare breeding shorebirds in Ontario (along with other rare species). These are essential in the preparation of national status reports for the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), provincial evaluations for the Committee on the Status of Species at Risk in Ontario (COSSARO), and recovery plans for RENEW (Recovery of Endangered Wildlife). NHIC data also contains detailed information on Great Lakes coastal wetlands that are of importance to shorebirds.

Bird Studies Canada has recently prepared lists of breeding species and their conservation priorities in each of the southern Ontario counties, districts, and regional municipalities to assist in setting conservation priorities at a local level. A few shorebird species are included in these lists, and as a result could benefit from habitat preservation efforts (www.bsc-eoc.org/conservation/conservmain.html).

The Great Lakes Water Quality Agreement of 1987 between Canada and the United States will also benefit shorebirds indirectly through several associated initiatives aimed at habitat improvement. The Binational Toxics Strategy is working for the virtual elimination of persistent toxic substances in the Great Lakes. The Lake Ontario Lakewide Management Plan (LaMP) is working toward maintaining, restoring, and enhancing diverse biological communities, including the development of Remedial Action Plans (RAPs) for a number of shoreline areas (www.on.ec.gc.ca/water/greatlakes/raps).

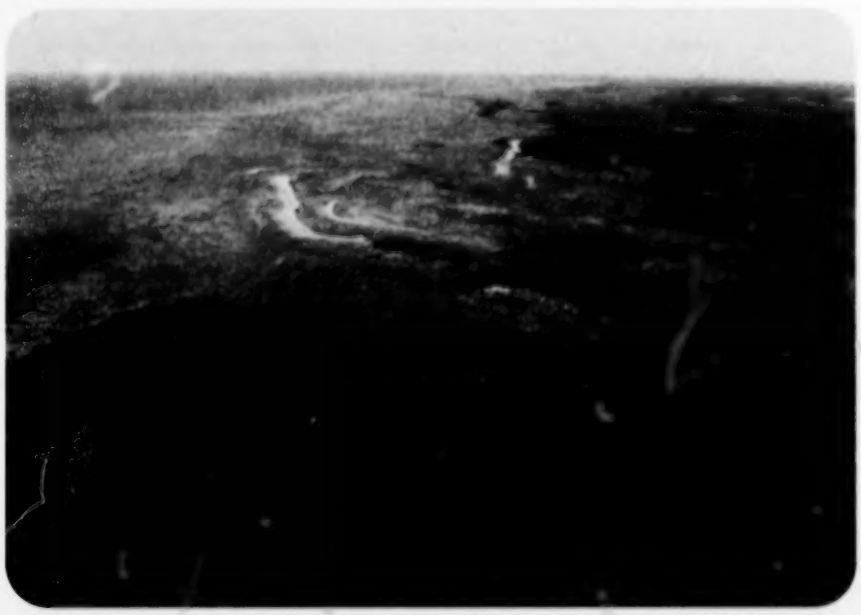
The Ontario Living Legacy Land Use Strategy (2000) has recently set a framework for future land and resource management on Crown lands across the central boreal areas of northern Ontario and most of the area on the Canadian Shield in southern Ontario. This process has identified the shorelines on Lake Superior and Lake Huron as a unique resource of global significance. A total of 2,900 kilometres of shores and adjacent lands within one kilometre, covering more than one million hectares, has been designated Heritage Coastline, complementing the Waterways Provincial Parks extending over more than 5,000 kilometres and 900,000

hectares in area. In addition, nearly 400 kilometres of waterways and adjacent lands covering about one million hectares have been recommended as Heritage Waterways by the Lands for Life process. These corridors would conserve special waterways to ensure no impairment of natural values if the recommendations are adopted. These would be of immense value to thousands of migrant shorebirds, and several shoreline nesting species in Ontario.

The Federal Policy on Wetland Conservation (Environment Canada 1991), in cooperation with the provinces and territories, and the Canadian public, makes a commitment to include wetland conservation as a fundamental part of all land use decisions involving federal lands or federal funds. The objective of the policy is to promote conservation and to sustain the ecological and socio-economic function of wetlands.

Provincially, the Ontario Cabinet (1984) approved the Ministry of Natural Resources' "Guidelines for Wetlands Management in Ontario", for land use planning purposes. These guidelines were released, along with an evaluation system for wetlands in southern Ontario, now updated, with a similar system for northern wetlands released in 1993. The purpose of these evaluation systems is to assess wetland significance, and provide a measure of the relative value of wetlands, for land use planning purposes. Ontario's first Wetland Policy Statement came into effect in 1992, under the authority of the province's *Planning Act*, and was included in revisions in 1995, which direct that natural heritage features and areas, including provincially significant wetlands, will be protected from incompatible development. By 1995, more than 2,600 wetlands had been evaluated and more than 350,000 hectares had been identified as provincially significant (Environment Canada 1995). These policy directions help to preserve both nesting and migratory habitats for shorebirds and other marsh nesting birds.

Conservation of upland habitat can also benefit some shorebird species such as Upland Sandpipers and the large plovers. Work to protect and enhance grasslands by organizations such as Tallgrass Ontario and the Barn Owl Recovery Team could indirectly help these species.



Aerial view of North Point / Guy Morrison, Canadian Wildlife Service

The aboriginal people of Ontario with their cultural association and intimate knowledge of the land are in a unique position to play a role in shorebird conservation in the province. They are major beneficiaries of wildlife, particularly in northern Ontario. They should be considered in, consulted with, and encouraged to be participants in all relevant conservation efforts.

Spotted Sandpiper / Mark Peck

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